THE NEWSWEEKLY OF INFORMATION SYSTEMS MANAGEMENT
November 13, 1989 · Vol. XXIII · No. 46 · 192 Pages · $2/Copy · $48/Year

SPECIAL REPORT
END-USER COMPUTING

COMPUTERWORLD

INSIDE

In Depth — Dimming for dollars at a US West data center. Page 99.

IBM's tardy disk drive, the 3390, is expected to surface Tuesday. Page 6.

Hitachi Data Systems chief discusses challenges ahead for the former NAS mainframe operation. Page 14.

Wang cuts aimed at improving customer service, confidence. Page 4.

CIS leasing firm falls under control of bankruptcy trustee; former OPM trustee James Hassett takes over as top execs resign. Page 105.

DEC's enterprise network scheme expected to be bolstered with demo of initial components. Page 7.

Unix Iron Curtain lowers as negotiations between AT&T camp and OSF gain momentum. Page 135.

Navy-IBM deals raked as congressional committee probes alleged bias in mainframe contract procurements. Page 8.

NCR catches Businessland bus with deal to stock shelves with IBM Micro Channel-based systems. Page 135.

Compaq chips away at mini vendors

BY PATRICIA KEEFE
CW STAFF

HOUSTON — Compaq Computer Corp. charged out of the desktop PC market last week waving its game plan for an assault on the traditional midrange markets. The primary weapon in its arsenal will be a new line of memory- and storage-intensive Intel Corp. I486, 32-bit Extended Industry Standard Architecture-based computers.

The firm announced a family of Deskpro 486 personal computers, but it is the debut of the multiprocessor-capable Systempro line, complete with mainframe-like multiple drive arrays and support for over 100 users, that represents the thrust of a new strategy for Compaq and its dealers. The firm is attempting to wrest corporate users away from proprietary minicomputers toward industry-standard PCs.

Compaq expects to sway corporate accounts by pitching equal or more processing power for a fraction of the cost of similarly configured proprietary minicomputers, said President Rod Canion. "We have raised the performance stakes fivefold, and it's guaranteed to send shock waves through the industry," added Compaq Chairman Ben Rosen.

Skeptical analysts conceded that Compaq's marketing thrust will cause further disruption in the already disheveled minicomputer market but noted that it will take more than sheer performance to win over mini-based users. "To compare MIPS rates is totally meaningless," said Dave Andrews, president of Andrews, Duerr & Manteghian, Inc., which specializes in consulting to System/36 and 38 and Application System/400 users.

Instead, software, scalability and support are seen as fundamental to the success of the efforts of the U.S. industry's third-

Continued on page 134

Bass has key to OS/2 code

BY CHARLES VON SIMSON
CW STAFF

MOUNTAIN VIEW, Calif. — Microsoft Corp. has quietly granted a virtual monopoly on OEM sales of a key piece of OS/2 networking technology to a tiny Silicon Valley start-up company that is headed by Charlie Bass, co-founder of local-area network vendor Ungermann-Bass, Inc.

Parallan Computer, Inc. has obtained one of only two franchises to use Microsoft and IBM OS/2 operating system source

Continued on page 133

Kendall outsources IS chief

BY ROSEMARY HAMILTON
CW STAFF

When Kendall Co. said it would decentralize two years ago, it wasn't kidding. With the operating units now chugging along autonomously, last week it was ready to take the next step — decommissioning the corporate information systems group.

The corporate IS director post has been eliminated, along with half of the IS staff. The remaining 10 people at corporate headquarters will serve on an operational basis and no longer function as an information systems clearinghouse for the company.

Ron Cipolla's work *at Kendall left the IS director with little to do but forge out on his own*

Ron Cipolla, former corporate IS director, has struck out on his own with a new technical services firm called Kentech. He has staffed it with 10 of his former employees and will count Kendall as his first account.

Both Cipolla and Gordon Khan, Kendall's chief financial officer, said the changes were made by mutual agreement. Kentech is an independent company, and Kendall did not invest in it, Khan said. Instead, the two will forge a relationship typical of those that Kendall now maintains with other outside consultants.

Kendall has been moving away from centralized management since early 1988. It pushed profit-and-loss responsibility out to its five business units and 16 subsidiaries and simultaneously began fitting IS into that plan.

The firm's plan called for Cipolla to oversee the redeployment of most corporate IS staff

Continued on page 14

Thurow says change is due

Economist Lester Thurow *says IS managers have their work cut out for them. In a* Computerworld *interview, Thurow takes corporate America to task. Page 87.*

Oil firm pumps cashless flow

BY ALAN J. RYAN
CW STAFF

NEW YORK — For several suppliers of Phillips Petroleum Co., the check is *not* in the mail. Nor is the remittance information.

Phillips, through Manufacturers Hanover Corp., is involved in an electronic data interchange pilot program that allows the bank to transmit payment and remittance information to the oil company's suppliers.

For Phillips, the EDI program is an opportunity to simplify its payment process. Phillips already has EDI arrangements for bills of lading and invoices with some of its transportation suppliers. When the company wanted to extend its EDI capabilities from order processing to include the task of funds transfer, Phillips went back to those vendors first to ask for their participation, said Larry McCall, assistant treasurer at Phillips.

The oil company plans to offer the EDI payment option to other accounts payable vendors early next year.

Manufacturers Hanover is somewhat distinctive in its ability to transmit both data and payment, analysts said, but it is certain that other banks will be closely watching its progress.

The fact that many banks are not yet involved with EDI programs is a problem in itself, said Art Walsh, manager of Mobil Corp.'s crude oil accounting

Continued on page 8

NEWSPAPER
[illegible] 3-DIGIT 48106
6UIV7ZE3GGNB3GGGGG 0010109457
UNIVERSITY MICROFILMS INT 0549
UNIVERSITY MICROFILMS INT
SERIAL PUBLICATIONS
300 N ZEEB RD
ANN ARBOR MI 48106
SECOND CLASS

IN THIS ISSUE

NEWS

4 Wang streamlines operations to the tune of 2,000 less jobs.

6 DEC users descend on the Magic Kingdom to check out the latest wizardry at Dexpo.

7 DEC expected to hint at the shape of architectures to come.

8 Congress doesn't like the cut of the Navy's contract jib, amid allegations of pro-IBM bias.

10 Worcester Polytech buckles beneath a hard-hitting viral onslaught.

10 CBEMA warns that antivirus legislation may be more hindrance than help.

14 Gary Moore, CEO at Hitachi Data Systems, formerly NAS, sketches in a few future landmarks.

133 Keeping your options open: Options traders unite to keep colleagues affected by San Francisco earthquake in business.

134 Compaq's Systempro a clear bid for a larger piece of the network server action.

135 Tri-dent: NCR hopes to pierce EISA armor with a trio of events.

Quotable

"Monopoly is not a word we like to use, but for now it does describe the situation in the OEM market."

RICHARD NISLEY
PARALLAN

After Microsoft licensed Parallan Computer, Inc. as sole OEM of OS/2 source code. See story page 1.

SYSTEMS & SOFTWARE

25 DEC puts some extra spring in its VMS 9000 step.

31 With a database's help, Roadway reaches for competitive pinnacles.

PCs & WORKSTATIONS

47 EISA and MCA 32-bit buses are a little beforehand in the world, as they wait for peripherals to catch up.

NETWORKING

71 The Bell tolls: Users back Tariff 12 legality.

MANAGER'S JOURNAL

87 The GAO takes feds to task for techno-gaffes.

COMPUTER INDUSTRY

105 Bob Daniels doesn't just wear it — this CEO plays polo as well.

IN DEPTH

99 How US West's automated data center cut costs and moved staff to more strategic tasks. By Larry Marshall.

DEPARTMENTS

6 News Shorts
22 Editorial
93 Calendar
95 Book Review
113 Computer Careers
124 Marketplace
129 Training
132 Stocks
136 Trends

UPDATE

Get ready for a blitz of retrospectives and predictions during the final six weeks of this decade. Here is what was predicted for the computer industry when the '80s began: Open systems standards would greatly influence product offerings. Supercomputers would feature gallium arsenide and supercooled Josephson Junctions. Artificial intelligence would become a standard feature. The Japanese would enter Western software and hardware markets. Micros would be available for homes and cars. And the merging of technologies would break down the DP manager's bastion of power — the glass house — forever.

US West's lights-out architect tells all. Page 99.

The topsy-turvy world of end-user computing sends IS professionals spinning. Special Report begins after page 98.

EXECUTIVE BRIEFING

■ **Moving a step closer to true EDI,** Phillips Petroleum and Manufacturers Hanover Bank have come up with an electronic data interchange system that goes beyond ordering and billing. Under the pilot project, Phillips is using electronic funds transfer to pay its suppliers. Full implementation of EDI has been hampered by the inability of most banks to marry such an electronic payment application to the exchange of data relating to orders and invoices. **Page 1.**

■ **It's Comdex week,** but much of the industry-rocking PC news hit the street last week. Compaq Computer Corp. not only announced its long-awaited Intel Corp. 486 and Extended Industry Standard Architecture (EISA) systems but set its sights on markets beyond the PC world — with claims that its new high-end system outperforms many traditional minicomputers. **Page 1.** Elsewhere, the 486 and bus wars heated up when NCR Corp., NEC Technologies, Inc. and Grid Systems Corp. announced 486 machines. However, while NCR opted for IBM's Micro Channel Architecture bus, NEC and Grid both went with EISA. **See stories pages 134 and 135.**

■ **Why has automation failed** to enhance office productivity in the U.S.? Lester Thurow, dean of MIT's Sloan School of Management, argues that computers have focused on simply producing more information in the existing structure rather than making the necessary fundamental changes. **Page 87.**

■ **IS in federal government agencies** exemplifies the problem, according to the General Accounting Office. The GAO unveils its "Hall of Shame," listing cases of IS "buying new stuff to do the same wrong thing faster." **Page 87.**

■ **Few IS organizations** control desktop computing in their companies. Their ability to ensure the security and effective use of corporate information systems stops at the PC. Many IS managers — frustrated by end users who clamor for support but prefer devising their own business solutions — are attempting new strategies. **Special Report begins after page 98.**

■ **Potential DEC VAX 9000 customers** must wait until spring for the VAX 9000, but they are confident that the new operating system will help solve DEC's traditional I/O bottleneck for commercial transaction processing. **Page 25.**

■ **Molding an IS organization** in the corporation's image led to the elimination of the central IS group at Kendall Co., where IS director Ron Cipolla moved on to put together an independent consulting group that lists Kendall itself as a major client. **Page 1.**

■ **On-site this week:** Lotus didn't do Windows, so Citicorp's Private Banking Group in San Francisco did the spreadsheet switch to Microsoft Corp.'s Windows Excel two years ago and has never looked back. **Page 49.** However, Roadway Express in Akron, Ohio, must constantly look back, sideways and ahead to monitor the schedules of 50,000 shipments per day. Its IS unit, Summit Information Systems, relies on an IBM SNA network supporting IBM mainframes, AT&T minis and Computer Corp. of America's Model 204 database management system. **Page 31.**

■ **An MBA can open doors** to management or bring a larger starting salary in some IS organizations. However, in most hirings and promotions, experience is weighed far more heavily than an MBA, according to a number of observers. The value of an MBA thus lies in parlaying the education into solid business experience. **Page 113.**

Systems software for MVS data centers:

Enter the world of total resource management, total support.

Computer Associates presents the industry's most extensive, integrated software for systems managed storage environments.

enforcing installation-defined storage standards and protecting data resources. It increases data center productivity by eliminating labor-intensive, error-prone tasks, freeing up valuable staff, cu

COMPUTER ASSOCIATES

Wang trimming its 'waste-line'

BY NELL MARGOLIS
CW STAFF

BOSTON — Wang Laboratories, Inc. last week offered up its prescription for saving the gravely ailing company: a streamlining of operations that will eliminate 2,000 jobs and will aim to give customers quick and easy access to Wang technology.

Dubbed "Operation Customer" by company President Richard Miller, who was named to the job in August, the plan targets Wang's vaunted bureaucracy and sets a goal of cutting out every bureaucratic layer not indispensable to users.

The 2,000-person layoff, to be effected by Jan. 1, will hit corporate positions across the board, with the noted exceptions of development and sales/support, "both of which are sacred," Miller said.

The plan will trigger a one-time charge against earnings, estimated at $30 million and scheduled to be taken in Wang's second fiscal 1990 quarter, ending Dec. 31. However, Miller said he expects the reorganization, which he termed a "revolution," to save Wang some $115 million annually.

Wang President Miller

"He's hitting the right places," said Stephen L. Koller, director of information services at Stamford, Conn.-based International Executive Service Corps.

Koller, whose company is "heavily invested in Wang," said that he questions whether 2,000 is a deep enough cut to render Wang profitable by spring, a Miller estimate reiterated several times at last week's briefing.

Miller said no further layoffs are planned but that further changes are likely for the company as it responds to the "constant change" of the industry.

Koller said he is inclined to give Miller the benefit of the doubt for now.

"I think he's excellent — tough, open, exactly what they need," Koller said. "People I've talked to at Wang — developers and salespeople — tell me that he's done wonders for morale; they say the whole environment's turned around at Lowell headquarters since he started."

Miller conceded the irony of calling customer satisfaction "revolutionary." The seemingly obvious acknowledgment that "our customers are our lifeline" has, he said, gone strangely unnoticed at Wang.

"Those Wang people who are close to the customer often lack technical expertise, and those with technical expertise often lack contact with the customer," Miller said.

Wang, Miller said, "now has over 800 product development programs, but only 72 of these . . . originated in a formal review process to determine whether or not customers really wanted the products being developed."

If recent history is any guide, he said, less than 10% of 300-plus new product introductions currently backlogged will earn more than $1 million in revenue for the company.

But now, Miller said, waste and confusion are about to give way to focus and efficiency.

"Mr. Miller's got his work cut out for him," said Joseph Preski, vice-president of information services at Nelson Entertainment Co. in Beverly Hills, Calif. "If someone is ill, you don't get encouraged because a doctor says, 'You should've come to me three years ago, and I could've cured you; now we'll have to amputate.' "

Blumenthal endeavors to calm fears at CUBE

BY NELL MARGOLIS
CW STAFF

ORLANDO, Fla. — Unisys Corp. Chairman W. Michael Blumenthal told customers last week that the company's recent $648 million quarterly loss marked the end of the beginning of the new Unisys, not the beginning of the end.

A record 2,100 or more turned out at a Cooperative Users of Burroughs Equipment (CUBE) semiannual meeting to hear Blumenthal address the group for the first time in five years. Many users remained skeptical, some even disgruntled at the chairman's failure to tell them much that they did not already know. But many others came away with a brightened view of the firm's prospects.

Unisys' Blumenthal

In reviewing the company's problems, he emphasized that "in one fell swoop, we reduced our break-even point by $1.5 billion, if not more." That, he said, is a harbinger of profits to come.

Making no attempt to disguise the reason for his appearance at the meeting, Blumenthal said that company advisors had told him, " 'You'd better deal with the question of whether or not Unisys is a takeover target.' Well, I can't deal with that question. I can't swear that won't happen, when we know all too well that no company in the country is invulnerable."

On the other hand, he added, "There is not the slightest bit of evidence that this is going to happen."

"If we're so important to him, it's odd that this is the first time he's been here in five years," noted Jerry Springer, director of computer services at the University of the Pacific in Stockton, Calif. He added, however, that he believed Blumenthal's appearance was a positive gesture, and that beyond that, there was little the chairman could accomplish in a user forum.

"The people here couldn't care less about the financial details unless it's a matter of the company's going out of business, and Unisys isn't on its way out," he said.

"I *did* come here concerned, very skeptical about the future of this company," said Paul E. Moore Jr., vice-president of The Huntington National Bank in Columbus, Ohio. Any sign of financial shakiness on Unisys' part is unnerving to his bank, which has recently signed on for Unisys' new imaging system. "Blumenthal, though, was very reassuring," he said.

Although his concerns were substantially allayed by Blumenthal's speech, Moore said, "I've still got one concern: They're still basing a lot of their revenue hopes on hardware."

Miller time

- **July 1985:** John Cunningham, would-be successor to Chairman An Wang, departs Wang Laboratories; Frederick Wang becomes president in 1986.
- **Spring-fall 1989:** 5,000 jobs are cut through layoffs and attrition.
- **August 1989:** Fiscal year loss of $424.3 million; Fred Wang replaced by Miller.
- **September 1989:** $175 million credit line granted.
- **October 1989:** $62.1 million first-quarter loss.
- **November 1989:** Corporate reorganization and 2,000-job work-force cut.

AT&T hooks up with SNA connectivity

BY JOANIE M. WEXLER
CW STAFF

AT&T last week opened the door to IBM's Systems Network Architecture (SNA) connectivity a little wider for users of its Unix computers.

Falling in with other vendors of proprietary networks that have seen the wisdom of linking users to competitors' devices on the corporate network, the firm announced new and enhanced software that allows AT&T Unix System V servers and Stargroup local-area networks to connect to IBM mainframes.

The Stargroup Software SNA Gateway allows 386 Stargroup servers to act as SNA gateways. It also provides MS-DOS workstations with IBM 3270 terminal emulation and connectivity to SNA hosts when connected via Stargroup LANs.

AT&T's enhanced Host Connectivity Software offers SNA and bisynchronous communications on AT&T's 3B2 minicomputers and 6386 Workgroup Systems, as well as peer-to-peer support of multiuser configurations. Physical Unit (PU) 2.1 support has been enhanced to connect both subarea networks and peer nodes as a PU 2.1 node and to support all LU types on a single PU 2.1 node.

"The announcement speaks to the trend in corporations to connect PC LANs to the corporate network," noted Michael Howard, vice-president at Infonetics, Inc., a Santa Clara, Calif., market research and consulting firm.

The connectivity software will reportedly allow Unix Mail to run over SNA between Unix machines and take advantage of VTAM 3.2, which resides on IBM mainframes.

COMPUTERWORLD

Editor in Chief
Bill Laberis
Executive Editor
Paul Gillin

News Editor
Peter Bartolik
Assistant News Editor
James Connolly
Senior Editors
Clinton Wilder, Management
Elisabeth Horwitt, Networking
Patricia Keefe, PCs & Workstations
Michael Alexander, PCs & Workstations
Rosemary Hamilton, Systems
Nell Margolis, Industry
Robert Moran, Software
Senior Writers
Alan J. Ryan
Maryfran Johnson
Joanie M. Wexler
Staff Writer
Richard Pastore
New Products Writer
Sally Cusack

Features Editors
Glenn Rifkin
Joanne Kelleher
Senior Editors
Michael L. Sullivan-Trainor
Ariel Kornel
Joseph Maglitta, In Depth
Mary Grover, Product Spotlight
Senior Writer
David A. Ludlum
Associate Editor
Laura O'Connell
Assistant Researchers
Jodie Nam
Kim Nash

Chief Copy Editor
Donald St. John
Assistant Chief Copy Editor
Joyce Chutchian
Features Copy Editors
Joseph J. Patton
Cathleen A. Duffy
Copy Editors
Carol Hildebrand
Gary Byrne
Catherine Gagnon

Art Director
Nancy Koval
Graphics Specialists
Frank C. O'Connell
John B. York
Graphics Researcher
Kevin Burden
Assistant Graphics Researcher
Paula Costa

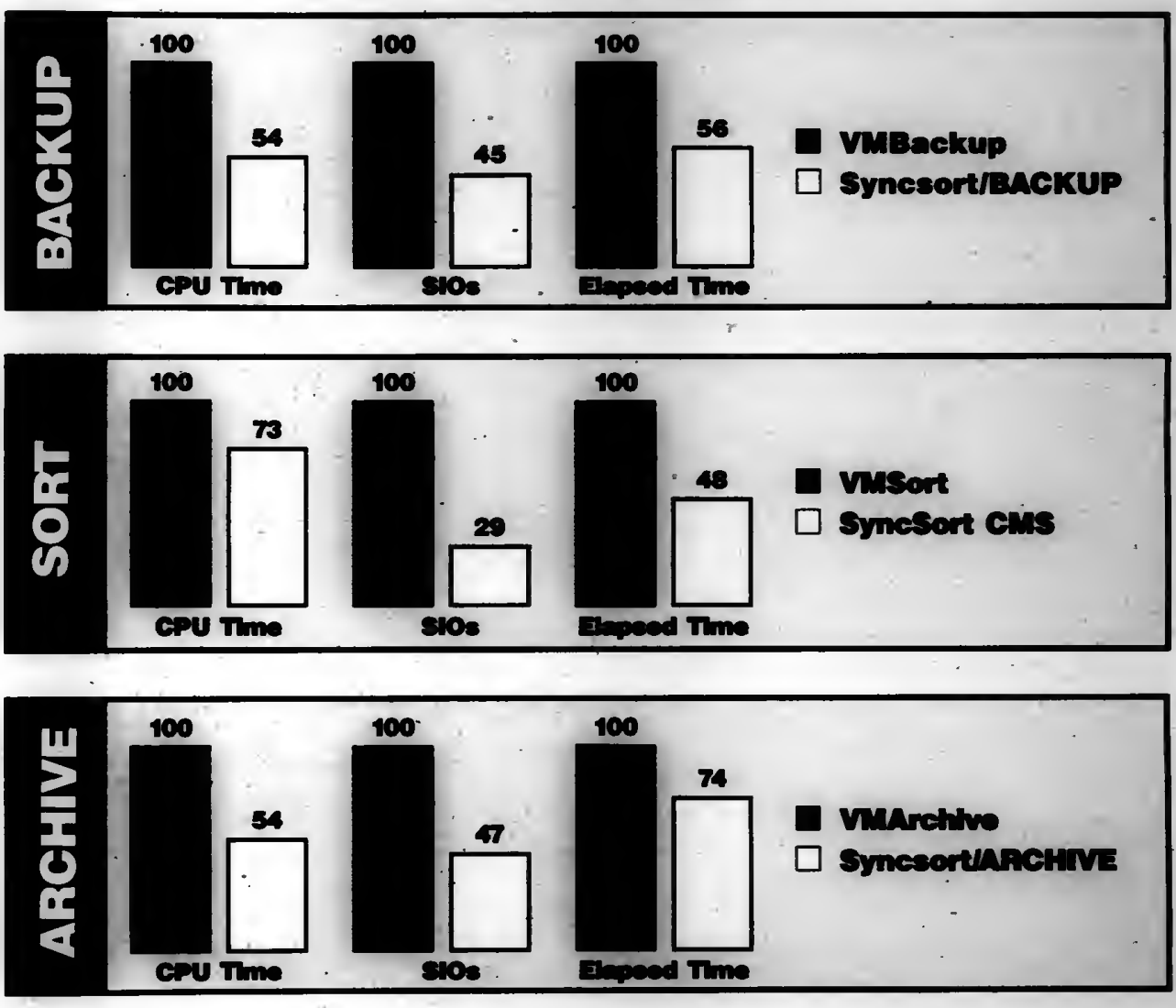
Assistant to the Editor in Chief
Linda Gergone
Editorial Assistants
Lorraine Wizell
Tammy Grysiewicz
Chris Lindquist
Rights and Permissions Manager
Sharon Bryant

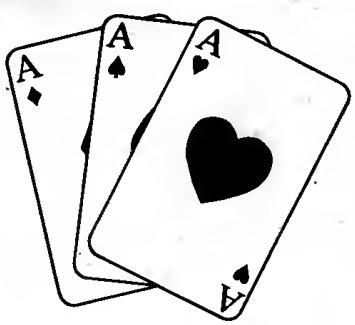
News Bureaus
Mid-Atlantic
201/967-1350
Robert Moran, Software Senior Editor
Amy Cortese, Correspondent
Washington, D.C.
202/347-6718
Mitch Betts, Bureau Chief
West Coast
415/347-0555
Jean Bozman, Bureau Chief
J.A. Savage, Senior Correspondent
Charles von Simson, Senior Correspondent
James Daly, Correspondent
Chris Flanagan, Editorial Assistant
Midwest
312/827-4433
Ellis Booker, Correspondent
Computerworld Focus on Integration
Editor
Ann Donley
Managing Editor
Lary Zottola
Senior Writer
Helen Pike
Art Director
Tom Maestro

IDG News Service
Penny Wise, Director

Main Editorial Office
Box 9171, 375 Cochituate Road
Framingham, MA 01701-9171
508/879-0700
Subscriptions: 800/669-1002

VM PERFORMANCE FROM SYNCSORT





Deal your system a winning hand.

To arrange for a test on your system, call us at **(201) 930-8200,** and see what VM performance from Syncsort can do for you.

syncsort INC.

WHERE PERFORMANCE IS THE ISSUE.

© 1989 Syncsort Incorporated, 50 Tice Boulevard, Woodcliff Lake, NJ 07675.
VMBackup, VMSort, and VMArchive are registered trademarks of Systems Center Inc.

NEWS SHORTS

Sparc sales flare

Sun Microsystems, Inc.'s Scalable Processor Architecture (Sparc) design made hay with Asian manufacturers last week with the announcement that Korean electronics giant Goldstar Technology, Inc. plans to market workstations based on the design. Sparc has found homes with such companies as Toshiba Corp., Datatech Enterprises and Tatung Co. planning reduced instruction set computing (RISC) machines. Goldstar said its machines are expected in late 1990. Meanwhile, Cypress Semiconductor has sold its version of Sun Microsystems' Sparc RISC architecture to Cern Laboratories in Geneva, Switzerland, one of the world's leading particle physics labs. Several hundred networked Sparc controllers will be used with the institution's particle accelerator, a 27-km underground ring that creates new materials by colliding electrons and positrons at high speeds.

Novell links EISA PCs to Ethernet

Novell Communications Products got into the act at last week's media event hosted by Compaq Computer Corp. in Houston with its announcement of a $1,295 Ethernet adapter for the 32-bit Extended Industry Standard Architecture personal computer platform. The Novell, Inc. subsidiary's NE3200, scheduled for fourth-quarter 1989 availability, was developed jointly with Compaq.

School ties, 1990s style

Students at Case Western Reserve University (CWRU) in Cleveland are communicating over what is being hailed as the first 100% fiber-optic campus network in the nation. Now 30% complete, CWRUnet carries data and video signals and will eventually handle voice traffic. Some 8,000 students and 3,700 faculty and staff will be on-line when the network is finished in 15 months. Users who plug into one of the 6,000 ports on the network using AT&T fiber-optic Ethernet adapter cards have access to electronic mail, on-line library services and bulletin boards. The entire CWRUnet project will cost $12.8 million, university officials estimate.

Armour heads Andersen group

Andersen Consulting announced last week that David H. Armour will lead its $100 million systems management practice. Armour, 45, will coordinate the consulting company's computer and network operations practices as well as its specialized technical consulting practices. Armour, formerly head of Andersen Consulting's Advanced Systems Group in the southwest region, will also direct Andersen's systems operations, which provides computer and network management services through centers in Chicago, Dallas and Stamford, Conn.

DEC delivers 15,000th Vaxcluster

The snap, crackle, pop was from champagne corks flying when Kellogg Co. of Battle Creek, Mich., and Digital Equipment Corp. joined up in an Anaheim, Calif., gala last week to celebrate delivery of the 15,000th Vaxcluster system. Kellogg will run transaction processing applications on its new Vaxcluster, company officials said. More than half of DEC VAX systems are configured in clusters, and two-thirds of the company's largest 200 accounts use them to manage their business, said Bob Glorioso, vice-president of high-end systems at DEC.

Back from the brink

More than 10 months after filing for Chapter 11 bankruptcy protection, Leading Edge should officially have new owners next week. Daewoo Telecom Co. Ltd. is expected to receive the formal approval of its acquisition and reorganization plan for the Canton, Mass.-based clone vendor on Nov. 15. The final word, which should come from Korean banking institutions that must locally approve the use of Korean corporate funds in foreign investments, authorizes Daewoo's legal ownership and full-time management of Leading Edge. The reorganized company is now shipping its Model D personal computers and plans to begin shipping new products as early as next month.

DEC users check each other out

BY MARYFRAN JOHNSON
CW STAFF

ANAHEIM, Calif. — The world's largest concentration of Digital Equipment Corp. customers descended on Disneyland last week, with hardly a moment to spare for Mickey, Donald and the gang.

Shuttling between the Dexpo West '89 trade show and the Digital Equipment Computer Users Society (DECUS) meeting, an estimated 7,000 DEC users checked out the latest gadgets in connectivity, software products and hardware enhancements (see story below).

But it was the chance to do a little peer networking that seemed to be the biggest draw.

"Solving one system problem can pay for the cost of the trip," said John Grden, systems manager at Lawrence Technological University in Southfield, Mich.

Common topics bandied about at the users convention and trade show included ways to integrate mongrel workplace personal computers with DEC VAX machines, managing systems upgrades and integration and ensuring network security. Connectivity products for Apple Computer, Inc. Macintoshes and DEC computers were popular.

Ralph Bradshaw, director of technology assessment for R.W. Johnson Co., a Raritan, N.J., pharmaceutical research firm, said local-area networks have become "an island of technology."

"We need a seamless network, some way to get all those PCs and Macs into the same VAX architecture," he said.

"We're really looking for ways to integrate it all," echoed Curtis Benner, a systems engineering manager at Andrews U.S. Air Force Base. "What I'd like to do is get it down to one terminal on one user desk."

Despite tough times in the computer industry, there was a palpable spirit of optimism at the DECUS meetings. In a survey conducted at the show by DECUS, among those in attendance, 66% of the 350 respondents estimated their information technology budgets would increase faster than inflation.

Voiced-activated computers and laptops were considered the hottest new computer technologies, the DECUS survey found. The one area where users expressed dissatisfaction was in VMS security features, with equal concern shown on data integrity and communications security.

Security on the Decnet Internet network was a theme that drew hundreds of users to a talk by Ron Tencati, security manager at the Space Physics Analysis Network (SPAN) at NASA's Space Applications Research in Lanham, Md. SPAN was hit most recently with a worm bearing an antinuclear message and snarling 300 machines on the system by changing passwords.

Tencati scolded the systems managers for ignoring the two major causes of worm attacks: lax system security and sloppy password practices.

Phase V on their minds

Another networking issue on the minds of many users was the upcoming release of Networking Phase V, new system software for the Decnet.

Phase V will bring about "a tremendous number of changes," said Kevin Oberman, network manager for the engineering department at Lawrence Livermore National Laboratories in Lawrence, Calif. "It's not application rewrites but network management as a whole that will be different."

Meanwhile, in nearby Los Angeles, DEC announced the establishment last week of the first of four in-house "resource centers" for transaction processing customers in Los Angeles, Chicago, New York and Atlanta.

Dexpo lures buyers with promise of VAX ease

BY MARYFRAN JOHNSON
CW STAFF

ANAHEIM, Calif. — Dozens of companies used the Dexpo West forum here last week to introduce products geared to make life easier for Digital Equipment Corp. VAX users.

Announcements included everything from real-time on-line performance monitors and new versions of spreadsheets and accounting software to VAX-compatible tools, electronic mail gateways, local-area network bridges, graphical interfaces and alternative database management systems.

Executive Software in Glendale, Calif., introduced a new data-caching system called I/O Express. The host-based system reportedly speeds up disk access and I/O throughput without gobbling memory, although it takes a generous amount — 256 pages of physical memory — to benefit users, according to Executive Software President Craig Jensen.

I/O Express automatically relieves I/O bottlenecks — a problem for on-line transaction processing — by transferring part of the work load to unused memory.

Other introductions included:

- Computer Associates International, Inc. in Garden City, N.Y., debuted Release 1.4 of CA-DB for VAX systems. CA added a performance monitor and boosted performance tenfold for complex queries in certain applications such as large join queries.
- SPSS, Inc. in Chicago introduced a new Unix-based release of its graphics software; SPSS Graphics Release 2.1 adds fully integrated interfaces to Oracle and Ingres DBMSs.
- An E-mail gateway product, Jmail-MHS, that connects the DEC Mailbus E-mail system to Netware and other LAN-based mail systems, was presented by Joiner Associates, Inc. in Madison, Wis.

IBM big-risk disk to debut

BY ROSEMARY HAMILTON
CW STAFF

IBM is expected to introduce its long-awaited high-end disk drive this week and, boy, does it have a lot riding on this.

A company spokesman confirmed that IBM has scheduled a large-systems storage briefing for Tuesday but declined to elaborate.

The so-called 3390 could be a multibillion-dollar baby for IBM if the product goes out the door in volume and without glitches. But, based on the drive's history so far, there is no guarantee either will happen.

Earlier this year, IBM halted a scheduled 3390 announcement at the eleventh hour because of technical problems.

The abrupt cancellation infuriated high-end users, many of whom were counting on delivery of the new drive this year.

IBM compounded the problem by keeping quiet on what exactly went wrong with the drive. Late last month, IBM was still holding firm that it would not give any indication of how serious the 3390 situation was.

Given the rocky history of the 3380 disk drive, unspecified problems with its follow-on caused some users to be concerned about IBM's high-end disk drives in general.

DEC's enterprise network architecture to hit the streets

BY ELISABETH HORWITT
CW STAFF

BOSTON — Digital Equipment Corp. is expected this week to provide the first solid evidence that its Enterprise Management Architecture (EMA) will in fact become commercial reality within the next year or two.

DEC is expected to demonstrate some early versions of key EMA components, provide a schedule for shipping a number of other crucial pieces during the next two years and add six more vendors to the roster of those that have committed to supporting its multivendor network management platform.

This first EMA rollout will provide limited functionality compared with the full-blown enterprisewide management system that DEC is promising over the long term, according to analysts and third-party EMA supporters. The initial pieces will include the following:

- A Decwindows, Vaxstation-based workstation that is said to allow the user to call up various network management systems in different windows on the screen.
- Links to the EMA workstation for existing DEC network management offerings such as Ethernim, Remote System Manager and Remote Bridge Management Software.
- Formal introductions, including availability dates, of links between EMA and the network management systems of some of the seven original EMA supporters. For example, T1 multiplexer vendor Stratacom, Inc. and bridge vendor Vitalink Corp. are expected this week to announce a joint network management product that will also interface with EMA.

The other EMA partners are Codex Corp., TSB International, Inc., Digital Communications Associates, Inc., Timeplex, Inc. and Siemens AG. Availability dates for the initial multivendor EMA connections are slated for the first quarter of next year, when the first EMA products will ship, according to Steven Mank, director of marketing at Codex.

Chevron Information Technology Co. is interested in EMA but only as one of a number of possible network management solutions. IBM's Netview, which is already installed at Chevron, and some third-party vendors will also be considered, analyst Ken Minet said.

The fact that the T1 vendor is on the verge of linking to EMA is of potential use to Chevron, a Stratacom user. More crucial to the energy company, however, is the speed with which DEC can deliver on its promise of Open Systems Interconnect (OSI) compatibility, since Chevron has made OSI the cornerstone of its multivendor network management strategy, according to Minet.

The initial EMA release was designed to bring existing Decnet Phase IV networks under EMA and does not provide the OSI compatibility that will be possible when DEC introduces Decnet Phase V in the third quarter of next year, according to Steve Wendler, a program director at Gartner Group, Inc.

Until then, EMA will not be able to exchange information with non-DEC "elements," or network management subsystems, via the OSI Common Management Information Protocol, Wendler said.

A large portion of DEC's announcement this week will consist of a general schedule for rolling out major portions of EMA over the next two years, sources said.

OS/2 marries into DEC family

BOSTON — Digital Equipment Corp. last week fulfilled a portion of its 2-year-old promise to make OS/2-based systems part of the Network Application Services (NAS) family of workstations, with full access to Decnet and NAS-based VAX/VMS services.

DEC announced Decnet for OS/2, which is said to allow Microsoft Corp. OS/2 Standard Edition workstations to participate fully in a Decnet Phase IV network, with the ability to perform task-to-task communications, terminal emulation, multiple-session support, electronic mail and bidirectional file transfer.

DEC also plans within a year to provide "a higher level of integration" between OS/2 clients and VAX/VMS servers by introducing an OS/2 version of its Personal Computing Systems Architecture (PCSA), company spokeswoman Joyce Radnor said. PCSA, which currently supports MS-DOS, was designed to provide client workstations with transparent access to shared files, as well as NAS-based services such as compound document exchange, on VAX/VMS systems.

Users can expect Decnet for OS/2 to migrate to full Open Systems Interconnect compliance with the advent of Decnet Phase V next year, Radnor said. The product costs $300 and is scheduled to ship in December, according to the company.

ELISABETH HORWITT

another 3380 another 3380
another 3380 another 3380
another 3380 another 3380
another 33xx another 33xx
until you've tried Innovation's
FREE DASD Management
Report Program...FDRQUERY

Let FDRQUERY Put You Back In Control of Your DASD

With Automatic Backup Recovery (ABR*):

- You can identify inactive data and archive it in compressed format to both disk and tape.
- ABR tracks the archived dataset and automatically and immediately recalls the data set when requested by a TSO user or a batch job.

Your choice. You can either keep buying expensive DASD or put ABR in control of your DASD.

VOLCNT	DEVICE TYPE	ALLOC TRACKS	BEFORE %ALLOC	AFTER %ALLOC	DAYS SINCE LAST USE	SAVINGS IF ARCHIVED DSN's	TRACKS	%SAVED
6	3380-K	173095	72.44%	52.66%	30	9423	47264	27.30%
				55.81%	60	5296	39722	22.94%
				60.48%	90	4199	28558	16.49%

Available for IBM VS1 and all MVS systems

Call for FREE DASD Management Report Program and FREE No Obligation 90 Day Trial.

INNOVATION® DATA PROCESSING

275 Paterson Avenue, Little Falls, NJ 07424 • (201) 890-7300

IBM bias charged in Navy specs

BY MITCH BETTS
CW STAFF

WASHINGTON, D.C. — Federal investigations of two U.S. Navy mainframe computer procurements found that the contracts were rigged to favor IBM hardware and lock out IBM plug-compatible vendors, according to testimony at a congressional hearing last week.

In both cases, Navy officials relied on IBM employees to help them write specifications for the contracts, the investigators reported at the first of a series of hearings being held by the U.S. House Committee on Government Operations.

The panel, chaired by Rep. John Conyers Jr. (D-Mich.), is studying allegations of IBM bias that were publicized last year by six plug-compatible vendors [CW, Dec. 12, 1988]. The IBM rivals include Amdahl Corp., Vion Corp. (a reseller for Hitachi Data Systems Corp.) and Storage Technology Corp.

"The Navy is rife with all-Blue shops," and Navy officials keep them that way by circumventing procurement rules that require full and open competition, charged Sidney M. Wilson, a spokesman for the so-called Gang of Six.

Navy spokesman Lt. James Wood said the Navy is conducting internal investigations, as well as following the congressional hearings and will take any action necessary to ensure that Navy computer procurements are conducted fairly and in accordance with federal laws and regulations.

William T. Rooker Jr., IBM's vice-president for federal marketing, said IBM has only a 14% market share in the Navy overall and is not the dominant vendor there. Furthermore, he declared, "Institutional bias toward IBM does not exist in the Navy or any other agency."

Rooker acknowledged that there are isolated procurement problems, but he said that the government is an intensely competitive marketplace, and no major reforms are needed.

However, committee members said that audits of several Navy procurements and a statistical report by the U.S. General Accounting Office (GAO) make it appear that the Navy steers contracts to IBM. "Contract procedures have been violated in at least two clearly documented cases in order to illegally favor IBM products," Conyers said.

The GAO market survey showed that the Navy has purchased IBM-brand mainframes and peripherals in 171 (or 72%) of 237 IBM-compatible hardware procurements in the last 3½ years. In dollar terms, IBM has 84% of the Navy's market for IBM-compatible mainframe hardware.

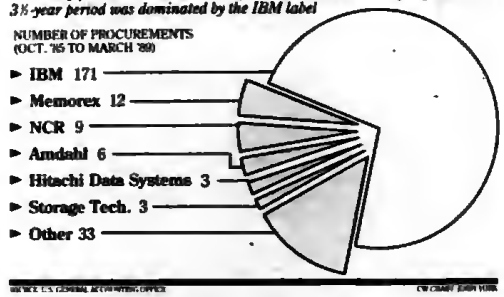
In the case of a Navy civilian payroll system, a GAO audit concluded that the Navy improperly allowed an IBM technical representative — and no other vendors — to help develop specifications for the $30 million system. The specifications effectively mandated the use of an IBM 4381.

In a second case, the Pentagon's inspector general found that a Naval Military Personnel Command procurement was biased toward IBM and that IBM was "heavily involved" in the acquisition strategy. Navy officials apparently wanted an IBM 3090 from the start, testified Derek J. Vander Schaaf, deputy inspector general.

Conyers and other lawmakers were shocked that IBM had briefed Navy officials on how to write the specifications and how to expedite the purchase by using a minority-owned small business as the prime contractor. "The Navy drove the whole process and asked IBM for help," Vander Schaaf explained.

Deep Blue seas

U.S. Navy procurement of IBM-compatible mainframes and peripherals in a 3½-year period was dominated by the IBM label



RTI hoists Ingres banner for coming RDBMS wars

BY JEAN S. BOZMAN
CW STAFF

ALAMEDA, Calif. — Nine-year-old Relational Technology, Inc. renounced its name last week and readied for another battle in the relational database management system wars.

Lofting the name of its DBMS as its new banner, Ingres Corp. attacked with a marketing campaign deriding unnamed competitors for making empty promises. That done, it announced that it had enhanced the database engine with two new modules: the rules-based Knowledge Manager and Object Manager, which allows users to define new data types.

Ingres

However, the corporate makeover contrasted starkly with news that Ingres sustained a $2 million loss in its first quarter ended Sept. 30 and imposed a hiring freeze.

"We had an internal forecasting problem, and we've since restructured the organization and announced that we're cutting operating expenses by 10%," a spokesman said last week. To correct the problem, 100 of the firm's 1,200 jobs were shuffled, and 70 planned hires will be postponed until the financial picture improves, the Ingres spokesman said. In the process, approximately 15 workers have left the company, he added.

Ingres "has to maintain their focus on their database engine," said Rob Anderson, a vice-president at Sutro & Co., a San Francisco investment firm. "That first-quarter loss caught them a little bit by surprise, and that's when a lot of reorganization took place."

Last week, Ingres product managers outlined a number of enhancements to the 2-year-old Ingres 6.0. Release 6.3 will be shipped starting this month.

Highlights of what Ingres is now calling "The Intelligent Database" include the following:

- Enhanced support for on-line transaction applications, an improved two-phase commit protocol to ensure the integrity of distributed transactions and automated access request controls.
- Knowledge Manager, a knowledge management system that allows users to incorporate business rules directly into the RDBMS. "The business rules used to live in the clients," said David Kellogg, Ingres' DBMS product manager. "Now, they live in the server, which improves consistency as well as performance."
- Object Manager, an object management system that allows users to define new data types, such as dates, temperatures and latitude and longitude.

Ingres' Kellogg *cites improved consistency*

Some beta-test users have had Ingres 6.3 in-house for up to eight weeks. The Public Broadcasting Service (PBS) is planning to port an existing indexed-file database of 130,000 television program records now residing on four Digital Equipment Corp. VAX machines to the Ingres 6.3 release.

The database, called the Network Operations Log Application, allows PBS to schedule national network feeds via satellite.

The enhanced Ingres has "been quite reliable, even in the beta version," said Frank Pellegrino, manager of operations and database applications at PBS' Alexandria, Va., headquarters.

Ingres 6.3 is scheduled to ship by the end of this month for VAXs running DEC's VMS operating system. Ingres 6.3 will be available for Sun Microsystems, Inc. computers by the end of the year and other Unix systems in 1990. Ingres 6.3 ranges in price from $5,000 to $180,000, depending on hardware system size.

Ingres 6.3 will be available as a free upgrade for Ingres Release 6.0 sites.

However, purchase of the knowledge and object management modules requires another fee. Knowledge Manager will cost 30% of the Ingres license, and Object Manager is priced at 50% of the license.

Oil firm

FROM PAGE 1

group and Mobil's representative to the American Petroleum Institute's (API) Petroleum Institute Data Exchange Subcommittee.

"You've got banks out in the middle of nowhere that don't even know what electronic funds transfer is," Walsh quipped. "That is going to be our biggest problem." Many of the banks that are beginning to look into EDI are still unable to transmit data and payments together, he said.

"The superregional banks are still not sure how far they will move into EDI," said Dave Taylor, service director of inter-enterprise systems at Gartner Group, Inc.

Instead, Taylor explained, they are watching their national and international counterparts tackle the technology.

Taylor said that while banking is a natural area to adopt EDI, smaller banks are not moving to the technology because it is simply too expensive to support all of the standards, build expertise and create new business units.

In its program, Manufacturers Hanover uses a translation feature that enables Phillips to use the standard data format, ANSI X12.4 820. The payment information, in the ANSI format, is translated into the appropriate format required by the suppliers. The bank's move to EDI is more of a positioning for future customer demands than an effort to reap enormous profits today, said Frances B. Silverstein, assistant vice-president and product manager for EDI at Manufacturers Hanover. "I don't think that any bank now is going to either have dramatic market share or have enormous profit margins on the business of electronic data interchange," Silverstein said. "The banks are in the business of EDI because our customers have decided that this is the way they want to move payment and remittance information in the next decade."

Over time, revenue will become important, Silverstein predicted, but for now "we simply want to be a strong player."

Profiting by EDI

The profits are likely to be found in the technical and consulting services area of EDI, Taylor said, will be in to handle the problems caused by reconciliation of electronic and paper transactions. "If you move EDI data, but you handle checks in paper, how do you make sure that the electronic information and paper information are reconciled? You need to build a system to do that."

Benefits to Phillips from the EDI program at Manufacturers Hanover will likely include savings in check preparation, mailing and reconcilement costs.

In the petroleum industry overall, a study conducted two years ago by the API showed that the potential savings to the industry could be over $500 million per year through EDI, said John L. Oshinski, coordinator of EDI at the API in Washington, D.C. More than 250 companies in the petroleum industry participate in EDI projects, Oshinski said, with a monthly transaction volume approaching two million records.

Find Out Why ORACLE Is Ranked The Number One DBMS. Attend A Free Data Management Conference In Your Area.

CONFERENCE LOCATION _____ CONFERENCE DATE _____

NAME _____

TITLE _____ PHONE _____

COMPANY _____

STREET ADDRESS _____

CITY _____ STATE _____ ZIP _____

HOST COMPUTER(S) _____ (OPERATING SYSTEMS) _____

Your purchasing timeframe (check one):

☐ Up to 3 months ☐ 3 to 6 months ☐ 6 months to 1 year

- Learn about the fully relational DBMS that's compliant with ANSI, IBM SQL.
- Explore the productivity of 4GL & DSS tools.
- See portable applications run across micros, minis & mainframes
- Learn how CASE can end your application backlog.
- Integrate PCs & MACs with MIS.
- See the latest distributed financial applications.

ORACLE®

COMPATIBILITY • PORTABILITY • CONNECTABILITY

Call 1-800-345-DBMS, ext. 8134 today

TO RECEIVE PRIORITY RESERVATIONS AT THE NEXT FREE CONFERENCE.

ORACLE
Conference Invitation

NO POSTAGE
NECESSARY
IF MAILED
IN THE
UNITED STATES

BUSINESS REPLY MAIL
FIRST CLASS PERMIT NO. 66 BELMONT, CA

POSTAGE WILL BE PAID BY ADDRESSEE:

CONFERENCE COORDINATOR
ORACLE CORPORATION
20 DAVIS DRIVE
BELMONT CA 94002

SAA. Oracle has it today.

Query Language, or SQL. Then, in 1979, two years before IBM delivered SQL/DS, Oracle Corporation delivered the first commercial implementation of SQL and has since become the largest database company in the world.

In 1988, IBM again produced a blueprint for the future of heterogeneous computing: Systems Application Architecture, or SAA. Oracle more than endorses this innovative vision. Oracle is delivering it. Today.

IBM's goals for SAA: "Applications that can be ported with less effort; applications that can span systems; user access to these applications that is simpler and more uniform; and programming skills that have broader applicability.[1]"

ORACLE is the only database software that runs on mainframes, minicomputers and PCs. In fact, ORACLE provides data transparency across your MVS, VM, VSE, and OS/2 environments in addition to over 80 other platforms and operating systems. Today.

Always a step ahead.

More than just a software company

Oracle offers more than just software. We offer solutions. No other database company can offer a full suite of services including systems integration, education, consulting and the #1 customer support[2] in the industry. Which is why Oracle has become the largest database company in the world.[3]

Just as SQL was the future of data management in 1978, SAA is the future in 1989. Make an Oracle seminar part of your future, today. Call 1-800-345-DBMS to reserve your seat in the next *Oracle* seminar in your area: So you won't be somebody else's first customer, tomorrow.

ORACLE®

COMPATIBILITY • PORTABILITY • CONNECTABILITY

Call 1-800-345-DBMS, ext. 8130 today.

Copyright © 1989 by Oracle Corporation. Oracle is a registered trademark of Oracle Corporation. IBM is a registered trademark of IBM. Other companies mentioned own numerous registered trademarks. TRBA

20 Davis Drive, Belmont, CA 94002 • World Headquarters (415) 598-8000 • ORACLE Canada (800) 668-8674 (except Quebec) • Quebec (514) 633-9800 • ORACLE Systems Australia 61 2 959-5080 • ORACLE Europe 44-1 940-8911 • ORACLE Systems Hong Kong 852 5-208048

1: IBM Journal of SAA 2: DATAPRO survey, August 1988, companies with sales over $10 million 3: Donaldson, Lufkin & Jenrette report

U.S. SEMINARS

AL	Birmingham	Dec 6f
	Huntsville	Nov 30*
	Mobile	Dec 7c
AR	Little Rock	Dec 7
AZ	Scottsdale	Nov 9 Dec 14f
CA	La Jolla	Dec 12f
	Los Angeles	Nov 7am Dec 7fi
	Newport Beach	Nov 16 Dec 19f
	Sacramento	Dec 20
	San Diego	Nov 14
	San Francisco	Nov 15af Dec 14f
	San Mateo	Nov 9*
	Santa Clara	Nov 21ac Dec 14fw
CO	Denver	Dec 5ap
CT	Farmington	Dec 12c
	Stamford	Nov 9f
DC	Washington	Nov 14f* Dec 12*
FL	Miami	Nov 9c
	Orlando	Dec 5*
GA	Atlanta	Nov 15c Dec 7*
	Savannah	Nov 2f
IL	Chicago	Nov 15fi Dec 13am
	Springfield	Nov 16
IN	Indianapolis	Dec 12f
KY	Louisville	Nov 16f
LA	New Orleans	Dec 15c
MA	Boston	Dec 7c
	Burlington	Dec 14f
	Worcester	Nov 1p
MI	Dearborn	Nov 7as Dec 5m
	Lansing	Nov 9f
MN	Minneapolis	Nov 7fm Dec 5f
MO	Kansas City	Nov 8f
	St. Louis	Nov 14fi Dec 12cm
MS	Jackson	Nov 14c
NE	Omaha	Nov 14f
NJ	Cherry Hill	Nov 14f
	Iselin	Nov 8f, 29f Dec 12m
NY	Buffalo	Nov 9c
	Melville	Nov 16f
	New York	Nov 1a, 29f Dec 13
	Rochester	Dec 12f
	Syracuse	Dec 13mpa
OH	Beachwood	Dec 13cf
	Cincinnati	Nov 14mpa
	Columbus	Dec 12f
OK	Oklahoma City	Nov 15c
	Tulsa	Dec 6
OR	Portland	Nov 9cf
PA	Philadel	Nov 7f, 28a Dec 12f
	Pittsburgh	Dec 14f
TN	Memphis	Nov 28* Dec 5f
TX	Austin	Nov 3c
	Dallas	Nov 7fm Dec 12f
	Houston	Nov 16f Dec 7f
	San Antonio	Nov 2c
UT	Salt Lake City	Dec 14f
VA	Richmond	Dec 8c
WA	Seattle	Nov 1, 7* Dec 11fm
WI	Madison	Nov 9

The following key indicates additional afternoon seminars that are offered with these seminar dates:

- *a Macintosh Networking*
- *c CASE/Application Tools*
- *f Oracle Financials*
- *i Oracle Int'l User's Group '89*
- *l Oracle Mail*
- *m Computer Integrated Manufacturing*
- *p PC Product Solutions*
- *u Unix*

Please note:

- * Seminars held for Federal Government only
- # Only the afternoon seminar is held that day.

CANADIAN SEMINARS

For registration call (800) 668-8926, except in Quebec, call (514) 633-9900.

Calgary	Nov 1, 16
Edmonton	Nov 9 Dec 7
Halifax	Nov 15
Kingston	Dec 5
Ottawa	Nov 2 Dec 14
Quebec	Nov 22
Saskatoon	Nov 9
Toronto	Nov 21 Dec 1, 12
Vancouver	Nov 9 Dec 14
Victoria	Nov 16
Winnipeg	Nov 23 Dec 6

Attn. National Seminar Coordinator
Oracle Corporation • 20 Davis Drive
Belmont, California 94002

1-800-345-DBMS, ext. 8130

☐ My business card or letterhead is attached. Please enroll me in the *FREE* ORACLE seminar to be held

at: _____

on: _____

Viruses shut out college in two matches

BY MICHAEL ALEXANDER
CW STAFF

WORCESTER, Mass. — In a match between viruses and personal computers at Worcester Polytechnic Institute last week, the viruses won big.

Two viruses — the Ping Pong and Pakistani Brain — hit "many hundred" PCs used by students and faculty at the engineering college in central Massachusetts, said David Cyganski, vice-president of information systems and services. The viruses rank among the 10 most prevalent ones, according to the Computer Virus Industry Association.

About 30 PCs in the college's main library were hit by the Pakistani Brain, a virulent and destructive virus that is designed in part to erase the boot sector of a hard disk drive and delete programs and files. "It wiped out every PC in the library," Cyganski said. The virus displays a message indicating that it was created by a programmer who was working for Brain Computer Services in Lahore, Pakistan, as a form of protest against software piracy.

The Ping-Pong virus — which occurs in other forms variously called the Italian, Bouncing Ball and Vera Cruz — infected hundreds of the 1,200 PCs on campus. It is highly infectious but is not designed to destroy programs or data. "When it appears, what you see is a small Ping-Pong ball that careens from corner to corner of the screen," Cyganski said.

The virus hit stand-alone, "open access" PCs used by students and faculty. "It took a while for word to reach us in the academic computer department, but after we found out about it, we shut down every PC to stop its proliferation," Cyganski explained.

The PCs in the library and open access area were out of commission for about two days while IS personnel ran virus detection and removal software on each PC.

Following the two episodes, IS personnel loaded all of the college's PCs with antiviral software that scans disks before they are used to help prevent the virus' recurrence. "Our days of innocence are over," Cyganski said.

Caution urged with virus laws

BY MITCH BETTS
CW STAFF

WASHINGTON, D.C. — The Computer and Business Equipment Manufacturers Association (CBEMA) last week urged legislators trying to outlaw computer viruses to take a more cautious approach and avoid overly broad remedies.

John Pickitt, president of CBEMA, criticized several of the bills recently introduced to criminalize computer viruses and other forms of malicious programming. "Like the swine flu vaccine of the late 1970s, these antivirus bills could end up doing more harm than good," he testified during a hearing held by the House Subcommittee on Criminal Justice.

Pickitt said that banning the programming techniques used to create viruses may prevent the use of similar techniques for beneficial purposes, including the distribution of a vaccine. Furthermore, outlawing the distribution of computer programs may restrict the free flow of information among researchers, he said.

Free speech?

Similarly, the Computer Professionals for Social Responsibility (CPSR), a group based in Palo Alto, Calif., said Congress should be wary of outlawing benign viruses. A self-replicating computer message, for example, could be a form of free speech protected by the U.S. Constitution, noted Marc Rotenberg, director of the CPSR's Washington, D.C., office.

With a little fine-tuning, current laws such as the Computer Fraud and Abuse Act of 1986 and older statutes against wire fraud may be sufficient for prosecuting virus cases, Pickitt said. On the other hand, the software trade association Adapso reiterated its view that the Computer Fraud and Abuse Act needs substantial modification to combat viruses [CW, July 24]. Similarly, the EDP Auditors Association said that the 1986 law has numerous flaws that make prosecuting virus cases difficult.

Carolyn Conn, testifying for the auditors group, said experience with the 1988 Internet worm shows that antivirus legislation needs to focus on networks as well as host computers and needs to cover both intentional and negligent acts.

Pickitt urged Congress to allocate funds for more federal computer-crime investigators and prosecutors and for more computer security research at the National Institute of Standards and Technology. "I would recommend that Congress wait until there is more case law under the 1986 act and until more of the state statutes have been tested before enacting new computer security legislation," Rotenberg testified.

With System 1032, now it's easy to get a grip on 25 billion long-distance call-minutes.

How does the US Sprint network modeling group keep track of some 25 billion call-minutes a year? Quite simply, in split seconds with System 1032 from CompuServe Data Technologies.

Using System 1032 4GL/RDBMS VAX software, the US Sprint network modeling group created an extensive network modeling system that increased the speed and efficiency of its work in forecasting and planning for the growth of US Sprint's vast fiber-optic communications network.

Think Big. "The total breadth of the data that System 1032 can handle on our network performance is of a staggering magnitude," said Michael Kovich, manager of database design.

Network performance data alone amounts to more than 1.5 million bytes a day, 365 days a year.

Think Fast. "What's important to us is that this mass of data be assessed and made available every morning like clockwork. So the software system's efficiency, reliability and quality help us meet our goals and objectives using the most up-to-date information."

Ease of use in the VAX environment and its host language interface are additional pluses for System 1032.

According to Kovich, "System 1032 was far easier for us to learn and also much quicker in what we wanted it to do. The first time we used it, we were building datasets within 30 minutes."

Think System 1032. If you have a large, sophisticated RDBMS application you need to get a grip on, do what US Sprint did: call on System 1032 from CompuServe Data Technologies.

CompuServe
Data Technologies
1000 Massachusetts Avenue
Cambridge, MA 02138

Think Big. Think Fast.
Think System 1032.

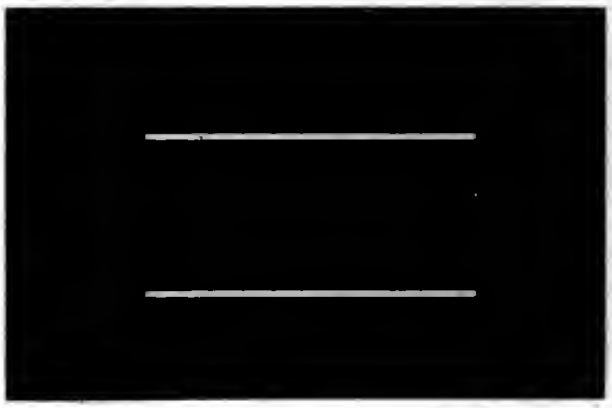
1-800-USE-1032 Ext. 500
8-6 p.m. EST

PDSFAST

It's About Time!

PDSFAST Is About Time and Money Saved by 1 Out of Every 3 MVS Users in the Following Critical Areas.

• DASD/SPACE Management-PDSFAST interfaces transparently with all existing DASD Management systems, reclaiming more space and saving up to 90% of the time and resources used. SPEAK TO ANY OF THE OVER 4,500 CONTRACTED PDSFAST USERS WHO, COMBINED, HAVE VIRTUALLY EVERY MAJOR DASD MANAGEMENT SYSTEM AVAILABLE, AND THEY WILL TELL YOU "No DASD management configuration is complete without PDSFAST."



• CICS/DATABASE Libraries — PDSFAST copies and compresses CICS and Database libraries in a fraction of the time presently used. Typical elapsed time for a copy or compress of screen libraries, and other similar datasets goes from about 40 minutes to under 1 minute. PDSFAST eliminates unnecessary system downtime spent waiting for copy and compress operations to complete.

• IEBCOPY/SPFCOPY — PDSFAST will replace all batch and interactive IEBCOPY and SPFCOPY/COMPRESS functions. PDSFAST will save over 80% of the time and resources presently used.

• SMP Processing — SMP and SMP/E both dynamically invoke IEBCOPY thousands of times during a typical run. PDSFAST reduces SMP and SMP/E run time and resource consumption by over 75%.

PDSFAST is now used at over 4,500 MVS installations worldwide. PDSFAST provides a competitive advantage for MVS installations of all sizes, saving many thousands of dollars in data center resources daily. PDSFAST is also saving thousands of individuals many hours of unnecessary time spent waiting for work to be completed.

Isn't It About Time You Had The PDSFAST Advantage!

For further Information call 1-800-272-7322.

SEA™ *SOFTWARE ENGINEERING OF AMERICA*®
WORLD HEADQUARTERS • 2001 Marcus Avenue, Lake Success, New York 11042
Tel: (516) 328-7000 1-800-272-7322 Telex: 6973556 Fax: (516) 354-4015

Products Licensed In Over 40 Countries

AI Corp. links up to VAX systems

BY ROBERT MORAN
CW STAFF

BOSTON — AI Corp. last week announced several cooperative processing enhancements and a way to tie together knowledge-based processing on IBM mainframes and Digital Equipment Corp. VAX computers.

AI, which is based in Waltham, Mass., said that it has incorporated its KBMS knowledge-based software and Intellect, its natural language software, into KBMS/VAX, a KBMS version that will be available in the first quarter of 1990 and interface with DEC's RDB and Oracle Corp. databases.

Beta-test user Jeff Griers, a senior staff specialist in the expert systems integration group at MCI Communications Corp., said that KBMS/VAX will allow MCI to exchange information between its IBM mainframe and VAX systems, leveraging the company's investment in KBMS skills.

"We are thinking of running knowledge bases on the VAX servers, on which we will do most of the processing, and then go to the mainframe for the business data," Griers said. "MCI has a heavy investment in VAXs — in fact, they run our network — and this will let us spread our investment in the technology on the network."

KBMS/VAX is expected ship in the first quarter of 1990 and will cost from $5,000 to $75,000, depending on the size of the processor.

In addition, AI said that it will provide remote database access to either KBMS or Intellect running on a personal computer or the mainframe transparently to the application program, starting with the LU2 communications protocol in the first quarter of next year and LU6.2 in the second quarter of next year. Either methodology will cost $25,000.

The company also announced that KBMS/PC under OS/2 Extended Edition has been enhanced with KBMS Developer Graphics, a facility that permits developers to graphically display and model objects and their relationships within applications, and KBMS Active Objects, an object-oriented tool for the development of graphical user interfaces for KBMS applications.

> "WE ARE thinking of running knowledge bases on the VAX servers, on which we will do most of the processing, and then go to the mainframe for the business data."
>
> JEFF GRIERS
> MCI COMMUNICATIONS

Both facilities are scheduled for availability in the first quarter of next year at no charge to current KBMS/ PC users under OS/2 Extended.

The same capability will be included in Intellect/PC, a workstation version of the company's Intellect 400 mainframe software that will become available in the second quarter of next year under OS/2 at $5,000 per copy and under MS-DOS at $3,500 per copy.

Ferei Doon Khosravi, senior information analyst at Southern California Edison, said that the company had been discussing OS/2 local-area network applications but did not have a knowledge-based system to complement the company's overall systems design.

"The fact that we have had to stay on host and give up the graphics has been a KBMS downfall," Khosravi said. "Graphics and the remote connection to the host will allow us to look at many other developments that we have had to holding." He estimated that IBM Personal System/2s will need 8M bytes of memory to efficiently run KBMS.

Zero Defects save Time and Money

Put your MVS environment on the fast track to zero defect production control and unattended operations
with the proven productivity tools from BETA Systems. We're already helping more than 500 MVS installations achieve the zero defect goal - with powerful, easy-to-use systems for preventing and detecting errors. Our systems automate labor-intensive, error-prone tasks without requiring costly changes in your MVS, MVS/XA or MVS/ESA environment. So you can realize time and cost savings from day one.

BETA91®
Automated Balancing and Quality Management System

BETA 91 cuts costs by automating virtually any batch verification or restart procedure. The most reliable and effective automated balancing and quality control system available today, BETA 91 replaces time-consuming and error-prone manual checking methods with efficient automated balancing procedures. You transfer your staff's valuable knowledge and experience into a data base which BETA 91 uses to verify production results - immediately and error-free. Your company holds on to years of experience regardless of staff changes. BETA 91 easily adapts to any application changes.

BETA92®
Job History and Output Management System

BETA 92 boosts efficiency with powerful, reliable SYSOUT archiving and retrieval. BETA 92 Job History and Output Management System offers online control and fully automated archival of your system output. BETA 92, an indispensable component of "Unattended Operations", means an end to the expense and difficulty of manually archiving and retrieving printed listings. You get convenient online SYSOUT control in a system that quickly pays for itself by greatly reducing printing, paper, storage and labor costs.

BETA93®
Report Distribution and Print Management System

BETA 93 assures that the right reports reach the right users at the right time. BETA 93 automates the separation, packaging, distribution and archival of all your production reports. BETA 93 offers a comprehensive solution to the labor-intensive problems in post-production: the printing, distributing, bundling and sending of huge amounts of paper. You save simply by printing only those pages which are needed and by archiving only those pages which are important - and everything automatically. Finally an end to the question: "Where's my list?"

I want the increased efficiency and savings of zero defect production control and unattended operations.

Yes, tell me more about BETA Systems Software:
○ All three systems
○ BETA 91 Automated Balancing and Quality Management System
○ BETA 92 Job History and Output Management System
○ BETA 93 Report Distribution and Print Management System
○ Prove to me that your service and support are as good as they say they are

Name _____ Title _____
Company _____
Address _____
City _____ State _____ Zip _____
Telephone (___) _____ CPU Make/Model _____ Op. Sys. _____

✉ In USA: BETA SYSTEMS SOFTWARE, INC. • 111 Anza Blvd., Suite 412 • Burlingame, CA 94010 • (415) 344-4014
✉ In EUROPE: BETA SYSTEMS SOFTWARE GMBH • Kurfürstendamm 182 • D-1000 Berlin 15 • (++49-30) 884-3060

BETA Systems

BETA Systems Software
USA (415) 344-4014
West Germany (++49-30) 884-3060
Austria (++43-1) 344-511235
Switzerland (++41-42) 221-707
United Kingdom (++44-251) 264-582
France (++33-1) 601-75500
Italy (++39-10) 646-9171
Finland (++358-0) 624-266

Got it?!

Now you can use old friends to access corporate data.

There you are cranking along at your desktop. Then it happens. You realize you need some critical data that resides on your mini or mainframe.

And you can't get it.

Unless of course you've got ORACLE.® For the first time PC and Macintosh users can access ORACLE and IBM® data from any of their favorite desktop applications.

You can query and update data on ORACLE, DB2,™ and SQL/DS databases, using the applications you know and love, including Lotus 1-2-3,® 4th Dimension,® Hypercard,™ Supercard™ and dBASE III Plus.™ Your entire company's wealth of information is available immediately. Without leaving the desktop.

With ORACLE for Macintosh,® you'll be using one of the most popular user interfaces to access corporate data. Give it a test run with the Developer's Version for just $199.

Or, you can have the Full Networking Version for only $999. If you're a 4th Dimension user, consider ORACLE for 4th Dimension, the easiest way to access corporate data through familiar 4D applications. Also $199.

On the PC use ORACLE for 1-2-3 for complete access to SQL databases from your familiar 1-2-3 interface. Or ORACLE dBXL, for giving dBASE III Plus applications access to your ORACLE and DB2 databases. Each for only $299.

Give one of these ORACLE products a try for 30 days. Then, if you're not happy, send them back and we'll send you a full refund.

If you're not ready to give up on your old friends, there's only one thing to do. Call 1-800-ORACLE 1, ext. 8163 now. And enter the computing environment of the 90s.

ORACLE®

Compatibility • Portability • Connectability

Copyright © 1989 Oracle Corporation. ORACLE is a registered trademark of Oracle Corporation. Macintosh is a registered trademark of Apple Corporation. Hypercard is a registered trademark of Apple Corporation. Supercard is a trademark of Silicon Beach Software Corporation. 4th Dimension is a registered trademark of Acius Corporation. DB2 is a registered trademark of International Business Machines. OS/2 is a registered trademark of Microsoft Corporation. Lotus and 1-2-3 are registered trademarks of Lotus Development Corporation. dBASE is a registered trademark of Ashton-Tate Corporation. dBXL is a registered trademark of Oracle Corporation. Prices valid in U.S. only. ORACLE for Macintosh, $999- Stand-alone version licensed for developer use only. Requires Macintosh SE or II with 2MB of RAM, 5MB hard disk space, floppy disk drive, and Hypercard 1.2. Includes 30-day installation support, ORACLE database, Flyer™SQL (HyperCard Interface), SQL*Plus, OCI and Pro*C (Macintosh Programmer's Workshop required for programming usage), System Stacks and Example Stacks. ORACLE for Macintosh, $999- Full networking version is $999 and includes SQL*Net (for database communications) Async, DECnet, TCP/IP support, Allen System's TSSnet DECnet protocol and drivers and Kinetics's FCPort TCP/IP protocol handler and gateway software for the other machine. ORACLE for 1-2-3, $299- Requires an 80286/80386 running DOS 3.0+ and Lotus release 2.01 or 2.2, 640KB of RAM plus either 1MB of extended memory or the rearrangement of 1MB of expanded memory. Connectivity option with networking software starts at $395. dBXL requires a XT PC with 640KB of RAM. Accessing remote systems requires database and networking software on host computer.

Hitachi Data Systems chief rewrites NAS script

BY J. A. SAVAGE
CW STAFF

SANTA CLARA, Calif. — Going public with his first interview since he became president and chief executive officer of Hitachi Data Systems Corp. (HDS), Gary Moore said last week that its majority Japanese owner, Hitachi Ltd., could be a drawback in dealings with U.S. customers but insisted it is a plus for the company's worldwide image.

As a 17-year veteran of minority-owner Electronic Data Systems Corp. (EDS), Moore said in an interview with *Computerworld* that HDS (formerly National Advanced Systems) would deal with EDS at "arm's length."

Moore also said the following:

- It is reasonable to expect a high-end CPU to be available within a year.
- The company may start selling new types of peripherals such as laser printers and tape libraries.
- All profits for the first three years will be reinvested and not siphoned off by its owners.
- The public will see a higher profile of the new company.

Hitachi's 80% ownership is both a blessing and a curse to HDS, which makes IBM 370-compatible architecture mainframes. It is one of two IBM-compatible mainframe vendors, the other being Amdahl Corp., that are more focused on larger-scale systems than HDS.

Customers initially said they were pleased because Hitachi was seen as having the deep pockets that former owner National Semiconductor Corp. lacked. Moore said the firm had been profitable for 19 of the last 20 quarters but that National Semiconductor absorbed much of the profit. He added that HDS has revenue of about $900 million per year.

HDS' Moore *said that Hitachi could be a detriment in U.S. dealings*

Some customers are beginning to say that they resent increasing Japanese ownership of American business, particularly in the wake of Sony Corp.'s acquisition of Columbia Pictures Entertainment, Inc. and Mitsubishi Estate's purchase of Rockefeller Group, Inc. Hitachi has always supplied Japanese-made hardware to the company, except for peripherals made in Oklahoma.

"I don't want to appear to be resurrecting deep prejudices and World War II, but I think [HDS is] rubbing our noses in [the Japanese ownership]," said James Franklin, vice-president of information services at Crowley Maritime Corp. in San Francisco. Franklin has had an NAS/HDS high-end mainframe for nearly five years.

Moore sought to shake the stigma of the Japanese way of doing business by insisting that Japanese style has no effect on the way the firm is run. "We argue and fight. We don't come in and bow and drink tea, where everything's prearranged," he said. "We're not trying to hide the fact that we're owned by a Japanese company. We also understand that in some corners there's some negativism to that."

Moore is trying to distance himself from his EDS background: "I was on the technical side of EDS almost all of my career, not in selling." He said that while he missed EDS and was loyal to it, he "started over" with HDS.

However, noted Bob Djurdjevic, president of Annex Research, a Phoenix-based consulting firm: "It's unreasonable to forget all the experience you had before."

As National Advanced Systems, the firm was soundly criticized for its lack of marketing skills. One of the most vocal critics was Djurdjevic, who said he cannot yet pronounce judgment on HDS' marketing effort.

Moore has brought in an IBM veteran, James Balassone, to head up marketing, and has done some consolidation.

"What marketing did exist was fragmented between three to four groups that didn't talk to each other. [For example], they would release products in Germany with a different MIPS rating," Moore said.

Deeper pockets

Hitachi's deep pockets are a technical improvement for HDS. While National Advanced Systems may have had advanced engineering projects, "they were used to having [funding] taken away from them" under National Semiconductor, Moore said.

Hitachi, on the other hand, spends $3 billion per year on research and development, the majority of which goes into computer products, Moore said.

Moore said that with Hitachi's hardware, such as optical channels and "nanosecond" wires, HDS can accommodate future mainframe needs, including transferring images and managing enormous databases. Those things are now constrained in software, he said, and his company has to wait for IBM-compatible software to emerge.

Kendall

FROM PAGE 1

members to the business units. At the same time, he implemented a downsizing strategy that ended the reign of the corporate mainframe and replaced it with a network of IBM Application System/400s.

It appears that Cipolla so successfully followed the corporate mandate for decentralization that he put himself out of a job. Earlier this year, it became apparent that the bulk of Cipolla's work on this project was done. However, when the questions arose of where Cipolla would go from there and how he would be rewarded for his effort, there were no easy answers.

Cipolla, it seems, hit the end of the line at Kendall. According to Khan, there is little chance for an IS executive at Kendall to move into the executive suite. "It would be a highly remote situation for an IS executive to move to a vice-presidency and then to the CEO's position," Khan said.

As Cipolla tells it, he found himself with time on his hands earlier this year and presented the idea of forming Kentech to management. Khan said Cipolla first asked management to allow corporate IS to function as a profit-and-loss center within Kendall, but management did not want to get into the technical services business.

People within Kendall think Cipolla got a "sweetheart deal," according to Khan, because management supported him on his Kentech proposal. Although Kendall did not financially back Kentech, it gave the new company its first big contract and has loaned it an AS/400 and 10 personal computers for one year, Khan said.

But Khan defends the help Kendall has given Kentech, saying that it made financial sense. Kentech would not only fit within its decentralization strategy, but it would also save it a substantial amount of money. Khan said eliminating the corporate IS function will save Kendall $500,000 in annual salaries.

Part-time only

"The [decentralization] was basically completed, so we had a corporate MIS staff with a lot of technical knowledge that wasn't required full-time in the company," Khan said.

"It's very difficult to have a corporate IS czar in that environment, because then a CEO of a division doesn't really have command of all the resources needed to run a business," Cipolla explained.

Meanwhile, Kendall is moving ahead with a plan that relies on divisional IS directors for day-to-day operations and outside sources for expertise on particular technical projects.

In addition, an advisory council, made up of these IS directors and outside consultants as well as Kendall's top financial executives, was formed two weeks ago to coordinate the efforts of inside IS directors and outside consultants and make decisions on long-range IS strategies.

Kendall will use Cipolla's new firm on a per-project basis. For the near future, that means Kentech will provide the services that the former in-house staff was providing on the networked AS/400s.

Kentech will participate in the Kendall advisory council, as will IBM and other outside consultants on which Kendall is increasingly relying. IBM, for instance, was recently selected to manage Kendall's corporate-wide AS/400 network. It also works closely with Coopers & Lybrand on IS management and implementation issues.

"What we see is a trend in business that companies can't have and be everything," Khan said. "We're seeing more alliances with outsiders as opposed to doing everything yourself."

Khan said the elimination of a complete corporate IS staff has been in the works for some time. When the company first anointed the business units as stand-alone profit-and-loss centers, it moved groups of corporate IS employees out to the different locations to support them. That left behind a core IS group that was referred to as corporate IS but had actually taken on the role of directing special projects, such as downsizing to AS/400s.

With the networked minicomputers in place, the corporate group found itself in a more passive role of overseeing systems that were up and running.

Proteon proves token-ring can run on unshielded wire

BY JOANIE M. WEXLER
CW STAFF

HOUSTON — IBM said it couldn't be done, but Proteon, Inc. claims to have proven that token-ring networks can indeed run over unshielded twisted-pair wiring at 16M bit/sec.

In a series of product unveilings last week that included the industry's first token-ring adapter for the 32-bit Extended Industry Standard Architecture (EISA) bus, Proteon announced support of 16M bit/sec. token-ring on unshielded wire. The IEEE 802.5 standard specifies the more expensive — but better protected — shielded twisted-pair cabling for token-ring.

Proteon also introduced an IBM Personal Computer AT unshielded twisted-pair adapter, a media filter allowing IBM Micro Channel Architecture computers to run on unshielded twisted pair and Tokenview Plus physical-layer network management software.

Going the distance

"Proteon was able to drive a signal through more hostile environments at the prescribed distance of 85 meters, which other people haven't been able to do yet," said Doug Gold, director of local-area network research at International Data Corp. in Framingham, Mass.

The Proteon announcement should "send IBM back to the lab" to engineer the same capability, according to Mary Modahl, an analyst at Cambridge, Mass.-based Forrester Research, Inc. She explained that IBM's skepticism toward 16M bit/sec. token-ring over unshielded wire has been because the interference problems could cause large signaling distortions at the higher speeds.

The network management offering is part of a two-tiered approach in which Tokenview Plus "elemental managers" monitor physical characteristics of individual token-rings, such as port traffic. Individual token-rings can be linked by a server and be collectively managed by Tokenview Manager.

Proteon's $995 EISA adapter supports Banyan Systems, Inc. Virtual Networking Software (Vines), Microsoft Corp. OS/2 LAN Manager, Novell, Inc. Netware 2.15 and IBM Networking Software. The IBM PC AT card is $895. Both the EISA and AT adapters will be available in volume during the first quarter of 1990, along with the $995 Tokenview Plus and the $1,995 Tokenview Manager. The $200 media filter is scheduled to ship in February 1990.

4th Generation technology finally reaches the data center.

Software AG announces the Data Center Management Series.

If you're tired of managing your high-tech data center with low-tech, antiquated tools, you need the Data Center Management Series™ from Software AG.

Why consider 4th Generation technology for data center management? Because you need it. You need powerful, integrated software to automate the three key areas of your data center:

- Job preparation/scheduling
- Console management
- Network control

Together, NATURAL OPERATIONS, NATURAL CONSOLE, and NATURAL NETWORK deliver advanced solutions for each of these areas.

More importantly, all Software AG technology works together, within one coherent architecture (ISA: **The open, Integrated Software Architecture**). This integration maximizes productivity, minimizes training time, and increases the overall performance of your data center.

And that's just the beginning of what integrated, 4th Generation technology can do to automate data center management.

The Data Center Management Series. From the world's leading software manufacturer: Software AG.

There's a new player in the data center: Software AG's Data Center Management Series provides a 4th Generation approach to data center automation. For more information, call toll-free: 1-800-843-9534.

SOFTWARE AG
PROGRAMMING BUSINESS SUCCESS

The Data Center Series can either stand alone, or be used with Software AG's ADABAS DBMS and NATURAL 4th Generation application development technologies.

© 1989 Software AG, ADABAS, NATURAL, ISA, The Data Center Management Series, NATURAL OPERATIONS, NATURAL CONSOLE, and NATURAL NETWORK are trademarks of Software AG.

Informix is the #1 d
And the only d

To develop your application faster, you need a 4GL that doesn't rely on COBOL or C to fill in the missing pieces.

INFORMIX-4GL.

A complete COBOL replacement.

Unlike other DBMS products, INFORMIX-4GL is a complete application development language for SQL databases. It's the only 4GL with full screen-building, report-writing and SQL database I/O capabilities designed into a single programming language. Which means it's a real COBOL-replacement-caliber tool. So you'll rarely have to revert to COBOL or C to customize an application.

10 times faster than COBOL. 3 times faster than any other 4GL.

When you leave COBOL and C behind, high productivity kicks in. In fact, with INFORMIX-4GL, you'll be able to deliver even the most complex custom applications at least 10 times faster than you can with COBOL or C. And 3 times faster than with any other 4GL.

Moreover, application debugging and maintenance are a breeze with our INFORMIX-4GL Interactive Debugger. You can view and debug your 4GL source code while the program runs. Even maintenance time will be reduced drastically. After all, with the non-procedural syntax there's less code to maintain. And the debugger makes it easy for others to understand and maintain your code.

What's more, our INFORMIX-4GL Rapid Development

Here's what it takes to make a complete 4GL. And only Informix has it all.

- ☑ Complete report-writing screen-building and database I/O language in a single product.
- ☑ Language comprised of non-procedural statements.
- ☑ Language flexibility equal to COBOL or C.
- ☑ Full SQL implementation.
- ☑ Application portability without recompiling*
- ☑ Complete source code debugger capability.
- ☑ A 10 to 1 increase in developer productivity.

atabase in UNIX.
omplete 4GL.

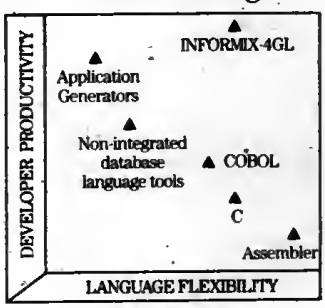
course, most every known version of UNIX. Better yet, it runs on more machines (over 200) from more manufacturers (85) than any other DBMS.

All that and a best-seller, too.

Informix DBMS products for UNIX, including INFORMIX-4GL, outsell their closest competitors by a substantial margin. So if you subscribe to the theory that there is safety in numbers, rest assured. With INFORMIX-4GL, the numbers are on your side.

System lets you compile your code in a fraction of the time you'd normally take. And you can port your applications to other operating systems without rewriting or recompiling a single line of 4GL code.*

INFORMIX-4GL is as flexible as conventional languages, but provides all the power of a 4GL with its non-procedural syntax for handling menus, forms, reports and SQL.



INFORMIX-4GL vs. other application-building tools.

Plus it's more portable.

You can take INFORMIX-4GL just about anywhere—MS-DOS, OS/2, VMS, and, of

Free booklet, "How To Choose A 4GL."

For a free copy of our new guide, "How To Choose A 4GL," call or write Informix Software, Inc., 4100 Bohannon Drive, Menlo Park, CA 94025. (415) 322-4100.

And solve the 4GL puzzle. Completely.

INFORMIX

#1 for good reason.

*Obviously, mixed 4GL/C programs or code written to take advantage of specific operating system features may need to be rewritten or recompiled.

Informix is a [illegible] trademark of Informix Software, Inc. UNIX, MS-DOS, OS/2 and VMS are [illegible] trademarks of their [illegible] manufacturers. © 1988, Informix Software, Inc.

AT&T to drive Hertz service

BY ELLIS BOOKER
CW STAFF

OKLAHOMA CITY — Hertz Corp. contracted with AT&T last week for packet switches and network management software to help the car rental firm consolidate its nationwide, multivendor reservation system.

A backbone network of AT&T packet switches "allows us to deploy a single, common corporate network that will meet all of our protocol requirements," said Gary Orrell, staff vice-president of MIS at Hertz, which declined to specify the amount of the five-year contract.

The contract calls for AT&T to provide an unspecified number of Datakit II Virtual Circuit switches to tie together an existing hodgepodge of networks. The Hertz ASAP reservation counter automation system, which the company finished deploying earlier this year, currently carries synchronous and asynchronous IBM System Network Architecture (SNA), Unisys Corp. Uniscope and X.25 packet data traffic to a data center here.

Hertz uses IBM Netview to manage and monitor 3270-type terminals on the SNA portion of the network. The introduction of AT&T network management products — specifically, Starkeeper Network Management System and Accumaster Consolidated Workstations — will complement Netview but not replace it, Orrell said.

Just how Netview will be integrated with Starkeeper and Accumaster, two components of AT&T's Unified Network Management Architecture, has to be worked out, however. But the concept of a single, integrated workstation for network management "was a driving force behind this decision," Orrell said.

This Software Can Organize Your Files, No Matter What Shape They're In.

No matter how you store your important documents, 3M Document Management Software (DMS) can help you manage those files more efficiently. Because unlike some automated filing systems, DMS can process paper, microfilm and digital files. And it will work even if you store your documents in more than one medium. Or convert from one storage medium to another. So you can plan for changes in your storage media more easily.

Another major benefit of 3M's DMS is that it makes efficient use of computer system resources. It does this by linking all related documents to a Master Record, which allows you to access files fast. DMS is also easy to install and implement. And simple to learn and use, because 3M tailors the software to your individual application.

3M has already installed DMS applications specifically tailored for Banking, Insurance, Manufacturing, and Accounting. And it's one of the only document management systems that will work with PC, Mini and Mainframe environments. So what are you waiting for? Start getting your filing system in shape today by calling the 3M Information Systems Group at 1-800-247-8516.

©1989, 3M

3M

Amdahl trots out in Unix system colors

BY J. A. SAVAGE
CW STAFF

SUNNYVALE, Calif. — Stepping out of its role as an IBM plug-compatible manufacturer, Amdahl Corp. last week announced two low-end mainframes to run on the Unix operating system.

The one- and two-processor computers can operate on Amdahl's UTS version of AT&T's Unix System V, Release 3.1. AT&T announced Release 4.0 earlier this month. Amdahl Vice-President of Unix Systems Bill Ferone said his company could not catch up to the newest release until sometime after 1990.

Amdahl has offered UTS on its standard IBM-compatible mainframes for eight years.

"If people are willing to shy away from Big Blue, they'll get hardware that's competitively priced," said David Card, an analyst at International Data Corp. in Framingham, Mass.

Bob Djurdjevic, president of Annex Research, a Phoenix-based consultancy, said it makes sense to offer a non-IBM system that can access IBM 370 architecture storage peripherals. "IBM's software price increases will get users to say, 'Enough already,' and they'll want to develop new applications on something else," Djurdjevic said.

Set for availability in January 1990, the 7300 series processors are based on an 18-month-old computer from Fujitsu Ltd., which owns part of Amdahl.

Ferone said that the computers could run Ultrix, Digital Equipment Corp.'s version of Unix. "It's an easy recompile," he said. Amdahl will develop tools to migrate from DEC's VMS to UTS.

The single-processor 7300-150 price begins at $730,000; the dual-processor 7300-250 begins at $1.25 million.

Who Can Deliver Private Network Control With Fractional T-1 Right Now?

The networking technology of the 1990's is available right now from GDC. Which means that our customers are taking advantage today of the limitless interconnectivity and lower tariffs of Fractional T-1 (FT-1) while maintaining private network control.

We have been implementing FT-1 networks for our international customers since 1985. Based on this experience we designed FT-1 into our MEGAMUX® Transport Management System (TMS).

MEGAMUX TMS embeds network intelligence into each DSO. For the first time you have the flexibility to configure, reconfigure and control individual DSO's – while maintaining network management integrity. As a result, we can provide you with the highest level of FT-1 functionality and network management control. Right now!

And you don't need complex external cabling or equipment to achieve this performance. This saves you a lot of time, money and installation headaches.

To ensure that you always maintain control, GDC utilizes an exclusive centrally weighted network management architecture providing global knowledge of the network from a single point. Redundant control can also be implemented to distribute visibility and control around the network.

And because true network management goes beyond backbone architecture, we provide all the products you need to manage your network from desktop-to-desktop.

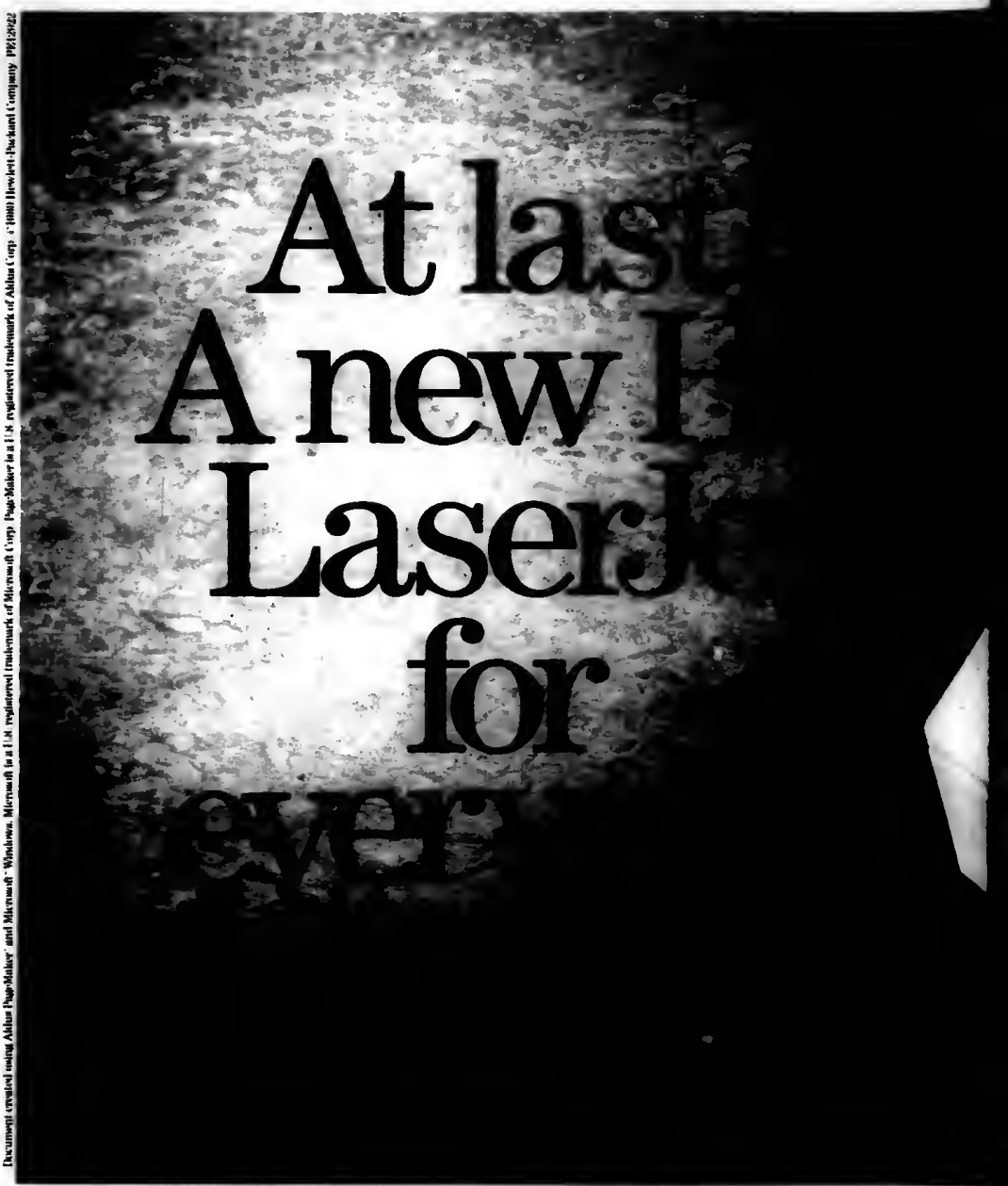
To find out more about the numerous advantages of a GDC FT-1 network, call or write for our free video. When it comes to offering FT-1 with the most functionality and control, **Only GDC Can.**

ONLY GDC CAN.

Call **1-800-777-4005**, General DataComm, Middlebury, CT 06762-1299. Tel: (203) 574-1118. Telex: 643357. Fax: (203) 758-8507.

See Us At CMA '89 Booth #1400 Nov. 28-30, New York Hilton.

General DataComm



Document created using Aldus PageMaker® and Microsoft® Windows. Microsoft is a U.S. registered trademark of Microsoft Corp. PageMaker is a U.S. registered trademark of Aldus Corp. © 1988 Hewlett-Packard Company PR12922

At only $1495, it's got "personal" written all over it.

The HP LaserJet printer family has expanded—in a small way.

The new HP LaserJet IIP (as in Personal) fits on a desk. And, with a price almost half of the multi-user LaserJet Series II, into most budgets.

Yet it's fully compatible with virtually all popular PC software and the LaserJet Series II. It has the same 300 dpi resolution. And carries on the family's reputation as the most reliable laser printers on the market.

*Suggested U.S. list prices: LaserJet IIP $1495; LaserJet Series II $2695. Dealer prices vary.

The LaserJet IIP was designed to be easy for any PC user. The simple front panel provides push-button control over the menu, the 14 internal fonts, form feed and other functions. It handles four different paper sizes: letter, legal, executive and A4, as well as envelopes. In portrait or landscape configurations. At four pages a minute. From one or two paper bins (the second is optional).

The 512K standard memory is upgradable to 4.5 Mbytes for more complex graphics and publishing programs.

So call **1-800-752-0900, Ext. 277J** for your nearest authorized HP dealer. Then introduce people at your company to their very own HP LaserJet printers.

There is a better way.

HEWLETT PACKARD

EDITORIAL

Risk of infection

ONE YEAR AGO, the computer industry stood still while it tried to sort out the implications of a malicious program that brought down computers on one of the nation's largest data networks. The Internet worm has caused many of us to take a hard look at the fragile slivers of silicon that make many businesses susceptible to sabotage and mischief. Yet little has happened in the past year to prevent a recurrence of the Internet incident.

As we reported last week, the Internet network, which links research institutions around the country, has been subjected to countless security breaches since last November. Viruses have turned up in the computers used by NASA, DEC, Decnet-based government networks and commercial software programs. Users nervously eyed the calendar last month to see if the dreaded Friday the 13th virus would strike. If anything, viral attacks are increasing, and users seem helpless to do much more than back up their data and hope for the best.

Why hasn't the industry been more successful in responding to the virus threat? One reason is complexity. You cannot simply affix a tamperproof seal to a software program the way you can to a bottle of aspirin. And every time one computer is connected to another, the risk of viral infection exists.

But there is a deeper conflict here. While users are worried about software sabotage, they are also more eager than ever to link their computers in larger and larger networks. How do you weigh the benefits of more sophisticated communications against the admittedly remote risk of a virus infection?

The fact that the freewheeling Internet has responded so slowly to the threat of a repeat attack shows that to its users, keeping the lines of communication open is more important than implementing clunky security procedures.

But for others, the spectre of a virus destroying even one record in a mission-critical database is enough to stand their hair on end. They would rather keep users out than risk a single invasion.

Somehow, these two personalities have to find a way to live together in a networked world. As networks proliferate, the number of access points to each computer on the network multiplies exponentially. With electronic data interchange and electronic funds transfer becoming a mandate in many businesses, corporations will find themselves with little choice but to open themselves to unknown outsiders.

It would be nice to think that computer sabotage is a twisted fad that will play itself out in time. But that isn't likely. As long as computers present the potential for mischief, there will be hackers equal to the challenge. More alarmingly, organized crime and espionage could become a real threat as the number of networked systems multiplies and the rewards of computer crime increase. Despite the lessons of Internet, we have made little progress toward reaching that delicate balance between ease of access and control, and the questions are only getting more difficult.

LETTERS TO THE EDITOR

Over-kill

The press has reported a grand total of three attacks of the dreaded Friday the 13th "killer virus" you trumpeted so loudly in "Virus outbreaks not so bad, but will get worse" [CW, Oct. 9]. Computerworld has been passing off as fact such claims as ". . . programmers are vying with one another to see who can write the most destructive virus with the least amount of code." Where did you get such sensitive inside information? Is it wild speculation that someone manufactured to add drama to an otherwise widely overreported story?

What is at stake in the effort to neutralize the threat of computer viruses is the openness of our entire intellectual community. The real target of viruses, whether their creators realize it or not, is the present and future accessibility of all public repositories of knowledge. In a world overrun with viruses, forbidding electronic use of the Library of Congress or our educational facilities becomes a reasonable course of action.

It has never required genius to shut down networks. Viruses simply allow agents to do it anonymously. Far more challenging is the task of providing security in an open community. The risk represented by viruses, like any other, will be managed poorly if the response inflicts worse deprivation than would the threat itself. We don't need more war stories from your imaginative correspondent in the field. We need accurate assessments of the threat and proposals for developing a rational, appropriate and measured response.

Ron Gagnon
Citicorp Citibank
New York

Summer essay

In response to Sabrina Skulsky's Viewpoint, "What I learned at IBM-Japan" [CW, Oct. 16], I felt that this should really be titled "How I spent my summer in Japan."

Two main problems arise: (1) Being a woman, Skulsky realized that Japan was male-oriented. Did she have to go there to discover this fact? (2) The statement about our stereotypes of Japanese management; maybe these were hers before she took the trip to the Far East.

No matter what, both statements display a lack of preparedness for her summer assignment.

Next time Ms. Skulsky goes anywhere, please have her submit that article to *Cosmopolitan*. It would be a better fit.

John P. Adams
Iona, Idaho

More unbundling

Please note two typographical errors in my letter "Unbundled" [CW, Oct. 16].

You changed "OS/400 is not included with the Licensed Internal Code (which is itself separate from the processor), and is by no means free" to "AS/400 is not included with the Licensed Internal Code." The change renders the sentence absurd: OS/400 is the operating system but AS/400 is the hardware, which of course is not free.

Also, "If anything, IBM is moving in the direction of more *bundling*" should have been "If anything, IBM is moving in the direction of more *unbundling*." This error was mine.

Seymour J. Metz
Annandale, Va.

Hardware survival

Our data center recently survived the Bay Area earthquake despite being located only 12 miles from the quake's epicenter. Our Unisys A-9F mainframe didn't miss a beat with the aid of an uninterruptible power supply unit that provided power purification and backup power.

Unisys deserved accolades for the quality that they have built into their computers and for the service they provided in supervising the construction of our data center. We were able to maintain a smooth operations flow, which is critical during a disaster, when our customers rely on us for the tools and products to rebuild.

Shortly after the quake occurred, Unisys field engineering representatives called to inquire if any support would be required. We appreciate the efforts of the disaster relief team that Unisys flew in to service the remittance processing equipment located outside of the data center. Members of this team quickly had this mechanical equipment back in service.

In short, although San Francisco's Bay Area experienced one of the worst natural disasters since the 1906 quake, Unisys products and services kept our operations on-line.

Arnold D. Schapiro
Director of IS
Orchard Supply Hardware
San Jose, Calif.

Computerworld welcomes comments from its readers. Letters may be edited for brevity and clarity and should be addressed to Bill Laberis, Editor, Computerworld, P.O. Box 9171, 375 Cochituate Road, Framingham, Mass. 01701.

User-driven, or just driving users crazy?

AMY WOHL

To hear computer vendors talk, everything they do is for the users. Having discovered customer requirements, customer feedback and customer satisfaction, every decision from product design to pricing is justified as "user-driven."

Why is it then that all of these user-driven companies keep making decisions that drive users crazy?

Part of this is simply the price of progress. If you want newer, more powerful personal computers and workstations, they're likely to cost more than older, less powerful systems.

The problem is at once more complex and more simple. Vendors are driven by a set of contradictory principles. They exist not to serve humanity but to make money. And that's all right, because by making money they fund much useful research that would otherwise go undone. Out of all this comes a lot of marginally useful stuff and an occasionally brilliant breakthrough.

Companies crave immortality. And if to stand still is to fall subtly backwards, then companies are fated to always strive for forward motion — to grow, to have a bigger market share, to create and dominate new markets. Customers may find good things to buy and use, but to pretend that these things would be created without the firm's eternal need for growth seems naive.

Users are driven by a somewhat different set of needs and goals. Often, individuals in giant organizations are only dimly aware of the larger organizational imperatives.

As computer buyers, users strive to meet individual and organizational business needs. This means their focus is on solving problems. Since problems are rarely identified before they become critical, solutions can rarely be sought or implemented in a leisurely fashion.

So the collision occurs because of the differing goals of users and vendors — and because both are always in a hurry. The interesting thing is that user and vendor goals are not at all mutually exclusive. Users want to be able to select from a rich variety of proven solutions. They want the hardware platforms they buy to be readily and nearly infinitely extendable.

New technology is not a marketing demon, invented by vendors to seduce users. Users want new technology, but they also need this new technology to come as a graceful evolution from current investments rather than as a plunge off a tall and icy mountain peak.

Vendors welcome new technology because it is in the change from the domination of one technology to another that new marketing opportunities are found. Of course, vendors that are successful with the older technology cling to it as long as they can, certain that their marketing success is tied to its ongoing existence. However, there is another side to every coin.

- Users want products to support their specific problems in a highly focused and useful way. But users don't want to invest in customizing generic products. Vendors can't make money building thousands of individually designed, customer-specific products — and customers would probably want them to be changed "just a little bit" anyway. Users need to understand that if it's worth doing, it's worth paying for the doing.
- Users want a competitive marketplace in which multiple vendors ensure a range of products at reasonable prices. But this kind of competition usually ensures that products will be identical. Then users complain that there is lack of compatibility, decreasing the value of the products they buy.
- Big vendors hate institutional standards; they're hoping that they can establish their own products as de facto standards and establish substantial market control. Small vendors need standards in order to establish an orderly market. Can this orderly procedure happen? In other words, can we let someone be very successful early in a market in order to establish some minimal de facto standard and then let the market proceed and competition enter? Don't worry, we'll never agree on how to let this happen!

I have a radical proposal: Let us agree that it's all right for vendors to make money. Users who begrudge their suppliers a fair profit are simply cutting off their own noses and spiting their future faces. Where will we get new products if such commerce is not a money-making proposition? And let us agree that vendors who offer raw technology — however exciting — and assume that the market will figure out what to do with it are offering us no real service at all. Products are only useful when they solve user problems.

Wohl is president of Wohl Associates in Bala Cynwyd, Pa., and editor of "The Wohl Report on End-User Computing" newsletter.

Interweaving IS and business

G. M. K. HUGHES

Information systems clearly believes itself to be in a crisis. What other profession feels so dispensable that one of its top three concerns is the education of senior management?

"I'd like to set up an appointment to educate you" sounds like a suicidal telephone call to me. It is clearly important for the strategic health of contemporary business and IS organizations that senior management have a full appreciation of the benefits to be derived from information technology. But to achieve that goal, IS is better off forgetting the phone call to senior management and focusing on integrating IS with the business.

Some IS leaders seem to think this will happen by suddenly being invited to participate in planning sessions from which they were previously excluded. A more satisfactory and more permanent solution lies in directly incorporating IS into the fabric of the business.

Says one IS chief, "The trouble is that my people don't understand the business." What should he do? In the long haul, he should hire different people and alter the climate. It is not logical to hire computer specialists who are turned on by optimizing the performance of some computer behemoth and expect them to enjoy helping computer novices increase their insights about the business.

So start hiring business majors with strong interest and training in information systems. If hiring the right people is the first step, then physical placement is next. You can't expect IS professionals to emote the business goals of an organization if they do not sit or eat lunch with the business folk.

One observes the opposite of this when the information people all sit together at a corporate data center. One can even observe cases where the "applications people" are in physical proximity to neither IS management nor business management, thereby ensuring maximum isolation.

Of course, every other staff group who wants a piece of the action has some argument in favor of being located at the hub. And every IS manager will be torn between having the IS staff within the compound and being in the outposts. But they must remember that outposts are prone to enemy attacks, secession or having prisoners taken.

Beyond territorial disputes, there's the question of who interacts with the business managers. One of the worst features of the traditional data processing organization, with its large, grand-design projects, was that those at the bottom of the pyramid never spoke to clients, and only a few of the others were let out without a keeper.

Alternatively, there were the cast-of-thousands meetings that had all the potential for communication of Wellington and Napoleon lining up at Waterloo. If an IS professional cannot interact with his business counterpart, then IS has got the wrong people.

JUDY DUFOUR LOVE

DO IS PEOPLE get invited to the business meetings, the annual marketing managers' meeting, the quarterly controller's gathering? Do the IS people ever get asked to speak at those meetings?

When IS people do talk to their business counterparts, what language do they use — their own or plain English? Do they know any verb other than implement, or any noun beyond environment? Environment was what James Watt mismanaged. Our chief executive officer is also a physician to whom an "application" is either an entreaty for a mortgage or a skin ointment. If IS wants to join business, it literally better speak the same language.

If the head of IS speaks nothing but computerese, he is not a candidate for chief information officer. If he speaks the jargon of the business world, or plain English, then he must insist on all his troops doing the same.

So far we have the right people, in the right location, speaking the right language, and nature will take its course. But not totally, for a single IS professional may only get his arms around a relatively small portion of the business. How do you learn more about the business?

What, for example, do IS professionals read? Is it only IS magazines and journals? Every business has its professional journals and trade magazines, but often one can search in vain for an IS name on the circulation list. And what external meetings are the IS people encouraged to attend, beyond user groups and computer trade shows? Are the IS people encouraged to go to shows at which their own organization exhibits? What better place to see how the competition is using information than at the relevant industry shows?

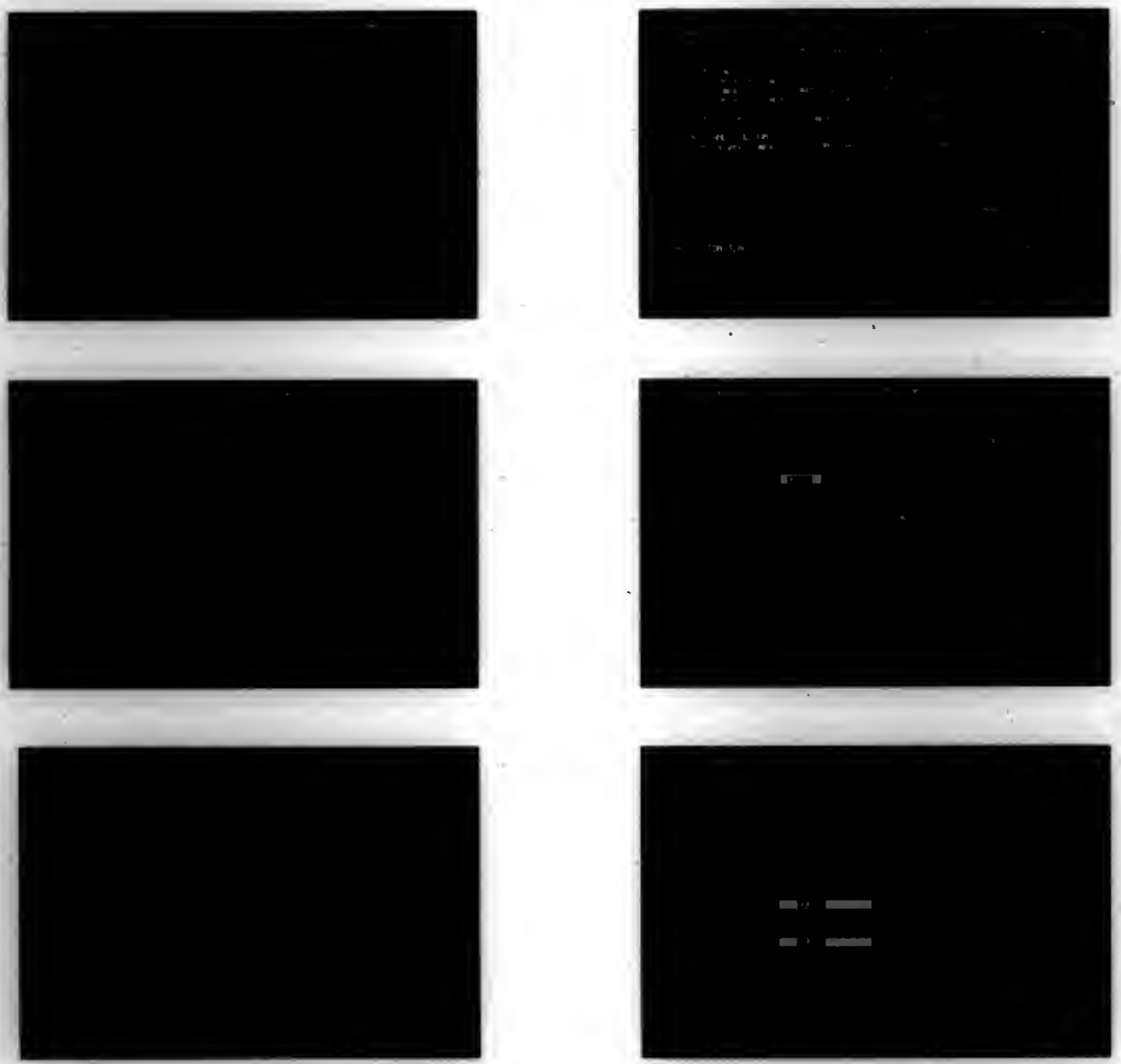
How many IS people have been out on a sales call? Is it even possible for those engaged in marketing and sales of systems to meet a customer? If this is impossible, then general management should not be surprised if the "computer people" are off in left field and the head of IS bemoans the ignorance of IS people about the business.

If the corporate culture doesn't support external travel, what about internal exposure? Do the IS people get invited to the the annual marketing managers' meeting or the quarterly controller's gathering? Do the IS people ever get asked to speak at those meetings? If they don't, then IS had better have the business folks over first.

Educating senior management about IS is still a crucial issue, but the most useful way of integrating business and IS is to integrate the people.

Hughes is vice-president, systems and communications, at Pfizer Pharmaceuticals in New York.

The first word in performance management is still the last.



OMEGAMON®

The OMEGAMON family for MVS.

To have the last word in your data center, call Terry Forbes today at (800) 541-8514.

Copyright © 1989 Candle Corporation. All Rights Reserved.

!Candle®
The one the others imitate.

YES, I want to receive my own copy of COMPUTERWORLD each week. I accept your offer of $44.00* per year — a savings of 57% off the single copy price. In addition, I'll receive special bonus sections of COMPUTERWORLD Focus on Integration.

First Name MI Last Name

Title Company

Address

City State Zip

Address shown ☐ Home ☐ Business ☐ New ☐ Renew Basic Rate $48 per year

*U.S. Only. Canada $110, Central/South America $130, Europe $195, all other countries $295. Foreign orders must be prepaid in U.S. dollars.

Please complete the information to the right to qualify for this special rate.

COMPUTERWORLD

1. **BUSINESS/INDUSTRY** (Circle one)
   10. Manufacturer (other than computer)
   20. Finance/Insurance/Real Estate
   30. Medicine/Law/Education
   40. Wholesale/Retail/Trade
   50. Business Service (except DP)
   60. Government - State/Federal/Local
   69. Communications Systems/Public Utilities/Transportation
   70. Mining/Construction/Petroleum/Refining/Agric.
   80. Manufacturer of Computers, Computer-Related Systems or Peripherals
   89. System Integrators, VARS, Computer Service Bureaus, Software Planning & Consulting Services
   90. Computer/Peripheral Dealer/Distr./Retailer
   75. User: Other _____
   99. Vendor: Other _____
   (Please specify)

2. **TITLE/FUNCTION** (Circle one)
   IS/MIS/DP MANAGEMENT
   10. Chief Information Officer/Vice President/Asst. VP IS/MIS/DP Mgt.
   21. Dir./Mgr. MIS Services, Information Center
   22. Dir./Mgr. Tech. Planning, Adm. Svcs. Data Comm. Network Sys. Mgt. Dir./Mgr. PC Resources
   23. Dir./Mgr. Sys. Development, Sys. Architecture
   31. Mgrs. Supvr. of Programming, Software Dev.
   32. Programmers, Software Developers
   OTHER COMPANY MANAGEMENT
   11. President, Owner/Partner, General Mgt.
   12. Vice President, Asst. VP
   13. Treasurer, Controller, Financial Officer
   41. Engineering, Scientific R&D, Tech. Mgt.
   51. Sales & Mktg. Mgt.
   OTHER PROFESSIONALS
   60. Sys. Integrators/VARs/Consulting Mgt.
   70. Medical, Legal, Accounting Mgt.
   80. Educator, Journalists, Librarians, Students
   90. Others _____
   (Please specify)

3. **COMPUTER INVOLVEMENT** (Circle all that apply)
   Types of equipment with which you are personally involved either as a user, vendor, or consultant
   A. Mainframes/Supermins
   B. Minicomputers/Small Business Computers
   C. Microcomputers/Desktops
   D. Communications Systems
   E. Office Automation Systems
   F. No Computer Involvement

E4946-0

YES, I want to receive my own copy of COMPUTERWORLD each week. I accept your offer of $44.00* per year — a savings of 57% off the single copy price. In addition, I'll receive special bonus sections of COMPUTERWORLD Focus on Integration.

First Name MI Last Name

Title Company

Address

City State Zip

Address shown. ☐ Home ☐ Business ☐ New ☐ Renew Basic Rate $48 per year

*U.S. Only. Canada $110, Central/South America $130, Europe $195, all other countries $295. Foreign orders must be prepaid in U.S. dollars.

Please complete the information to the right to qualify for this special rate.

COMPUTERWORLD

1. **BUSINESS/INDUSTRY** (Circle one)
   10. Manufacturer (other than computer)
   20. Finance/Insurance/Real Estate
   30. Medicine/Law/Education
   40. Wholesale/Retail/Trade
   50. Business Service (except DP)
   60. Government - State/Federal/Local
   69. Communications Systems/Public Utilities/Transportation
   70. Mining/Construction/Petroleum/Refining/Agric.
   80. Manufacturer of Computers, Computer-Related Systems or Peripherals
   89. System Integrators, VARS, Computer Service Bureaus, Software Planning & Consulting Services
   90. Computer/Peripheral Dealer/Distr./Retailer
   75. User: Other _____
   99. Vendor: Other _____
   (Please specify)

2. **TITLE/FUNCTION** (Circle one)
   IS/MIS/DP MANAGEMENT
   10. Chief Information Officer/Vice President/Asst. VP IS/MIS/DP Mgt.
   21. Dir./Mgr. MIS Services, Information Center
   22. Dir./Mgr. Tech. Planning, Adm. Svcs. Data Comm. Network Sys. Mgt. Dir./Mgr. PC Resources
   23. Dir./Mgr. Sys. Development, Sys. Architecture
   31. Mgrs. Supvr. of Programming, Software Dev.
   32. Programmers, Software Developers
   OTHER COMPANY MANAGEMENT
   11. President, Owner/Partner, General Mgt.
   12. Vice President, Asst. VP
   13. Treasurer, Controller, Financial Officer
   41. Engineering, Scientific R&D, Tech. Mgt.
   51. Sales & Mktg. Mgt.
   OTHER PROFESSIONALS
   60. Sys. Integrators/VARs/Consulting Mgt.
   70. Medical, Legal, Accounting Mgt.
   80. Educator, Journalists, Librarians, Students
   90. Others _____
   (Please specify)

3. **COMPUTER INVOLVEMENT** (Circle all that apply)
   Types of equipment with which you are personally involved either as a user, vendor, or consultant
   A. Mainframes/Supermins
   B. Minicomputers/Small Business Computers
   C. Microcomputers/Desktops
   D. Communications Systems
   E. Office Automation Systems
   F. No Computer Involvement

E4946-0

NO POSTAGE
NECESSARY
IF MAILED
IN THE
UNITED STATES

BUSINESS REPLY MAIL
FIRST CLASS PERMIT NO. 55 MARION, OH 43306

POSTAGE WILL BE PAID BY ADDRESSEE

COMPUTERWORLD

P.O. Box 2044
Marion, Ohio 43306-2144

NO POSTAGE
NECESSARY
IF MAILED
IN THE
UNITED STATES

BUSINESS REPLY MAIL
FIRST CLASS PERMIT NO. 55 MARION, OH 43306

POSTAGE WILL BE PAID BY ADDRESSEE

COMPUTERWORLD

P.O. Box 2044
Marion, Ohio 43306-2144

SOFT TALK

Robert Moran

Down but not out

We are at the end of a decade. The future is promising; the present, anxious; and the past, apparently meaningless.

Although doomsayers must wait another 10 years before tradition tolerates their century-ending howls, modern technology has gotten the signs and ciphers off disk. They must make themselves known.

Fourth-generation language (4GL) developers, or rather vendors, say they will grind their heels in the face of Cobol — already down, winded by its own weight.

However, Marc Sokol, executive vice-president of Realia, Inc., has argued — and I think convincingly — that 4GLs and their proponents have yet to deliver the goods.

They are fast, the 4GLs.

Continued on page 36

Inside

- Roadway moves mountains with help from Summit. Page 31.
- Using characterless programming can be a graphic nightmare. Page 31.

VMS makes the 9000 upgrade

ANALYSIS

BY MARYFRAN JOHNSON
CW STAFF

MAYNARD, Mass. — The recent debut of Digital Equipment Corp.'s mainframe VAX 9000 told only half the story.

The true test of a mainframe heavyweight lies in its operating system — the engine that drives the big box.

In introducing the VAX 9000 late last month, DEC President Ken Olsen acknowledged that fact when he called the VMS operating system "the heart and soul of DEC's operation."

That heart and soul are still in the shop, however.

The delay between the fall unveiling and spring shipment of the mainframe VAX is caused mainly by tinkering needed to enhance the new unnamed version of the VMS operating system, Prudential-Bache Securities, Inc. analysts noted last week. When the new system software appears, it will be "just another release" of VMS, company officials stress, although they expect it to be able turn a 30-hour job into a 4-hour task.

Feeling good

"Clearly, the software must live up to the hardware, but I am completely confident that if DEC can pull off the technical innovations in the 9000, it will provide any changes needed for VMS within a reasonable period of time," said David Renaud, director of technical services at Grinnell Mutual Group in Iowa.

"To non-VAX customers, this machine gives them the opportunity to buy a mainframe-class system with all the advantages of the Digital VAX environment," Renaud said. "One of the largest advantages is the ease of systems management vis-a-vis the IBM mainframe."

"What IBM always [criticized DEC for] was that we didn't have the I/O capabilities to run commercial applications," said Rich Whitman, marketing manager for the 9000. "Now, we've put to bed once and for all that we can do I/O as well as anyone in the industry."

Continued on page 33

Key features

According to analysts, users and DEC, the most significant features expected with the next release of VMS are the following:

- Additional vector-processing features such as Computer Interconnect (CI) load sharing, which allows applications to take advantage of the higher I/O bandwidths of the 9000. If one interface is busy, the load will shift to another of the CIs.
- Disk Striping, a significant capability in running commercial software, allows users to move data off the disk and into the central processor from 10 different locations at once.
- New on-line transaction processing features, each embedded in the new operating system. A key feature will be two-phase commit, which allows databases or transactions to be distributed across multiple systems. For example, two-phase commit allows simultaneous, synchronized updating of data that is crucial to stock transactions.

MARYFRAN JOHNSON

Tape-drive beggars can now be choosy

BY ROSEMARY HAMILTON
CW STAFF

My, how the table has turned for IBM AS/400 tape drive users.

Earlier this year, many users were in a panic because their tape backups were inefficient and running way over schedule. Users were stuck, however, because the IBM tape drive was inadequate, and no third-party offerings were yet available.

However, several third-party suppliers began delivering Application System/400 drives during the summer, and IBM began shipping a much-improved drive, the 3490, just a few weeks ago. As a result, users have gone from zero options to several. Instead of being trapped with a drive that even IBM acknowledged as inadequate, users are now calling the shots as they pick and choose from a host of drives.

"I found the answer, and it's the drive manufactured by Cipher," said James Foster, manager of international information systems at Abbott International Ltd. in Chicago. "Backups have been a compromise between risk and inconvenience. Now I can do what I have to do. I'm thrilled about it."

Like several other users, Foster was greatly disappointed in the AS/400 tape backup but made do with available drives from IBM. However, when IBM introduced the 3490 last summer, Foster did not like the price tag. Then he heard about a Cipher Data Products, Inc. drive. With a starting price of $25,000, the Cipher offering comes in at less than half the cost of the 3490.

"I can't sell someone on a $60,000 drive," Foster said, referring to the 3490. "The people that give me my approvals would laugh me out of their office."

Joe Voloshin, technical support manager at Adventist Health System West, said he plans to sit tight for a few more months until all the third-party vendors have presented their products.

Earlier this year, Voloshin was running tape backups with IBM 2440 drives on 12 AS/400s. It took him twice as

Continued on page 33

RC/UPDATE™

The one DB2 Management Tool that will make you a Leader!

Do you need a product that. . .

- Manages the ALTERation of DB2 objects, even those changes not directly supported by DB2?
- Will test and execute embedded SQL in your programs?
- Provides an extended ISPF-like editor for browsing and editing data in DB2 tables?
- Will test SQL statements in batch or online, and produce a full audit trail?
- Has a DB2 Space Calculator for calculating the DASD space requirements for DB2 objects?
- Supports all DB2 V2.1 options, including referential integrity and secondary IDs?
- Provides an interactive facility for copying data between DB2 tables?

Then you are looking for the Expert DB2 Object and Data Management Tool. . .

RC/UPDATE. No other single product contains all of the features that RC/UPDATE does. It is the "thoroughbred" of DB2 utility software, from the best in the business. It leaves the competition at the starting gate.

Call today for more information or a free PRODUCT EVALUATION:

1-800-442-6861
1-800-848-0140 (In Canada)

IBM Business Partner

PLATINUM technology
The DB2 Company™

The leader in DB2 Object and Data Management

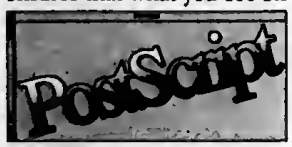
555 WatersEdge Drive Lombard, IL 60148 (312) 620-5000

1 The NeXT™ Computer System is the first computer in the world (and so far the only) to use read/write/erasable optical storage. While PCs today are typically equipped with Winchester drives that store 20 to 40 MB, a single optical disk can store 256 MB. Plus, it is removable, for portability and added security. This dramatically new technology provides storage that is simultaneously vast, reliable and cost-effective—a combination unmatched by computers of any size.

2 NeXT has made the power of UNIX* usable by mere mortals. UNIX is the high-performance operating system used by workstations to achieve true multitasking and superior networking. Unfortunately, it has always been the antithesis of user-friendly. NeXT has given UNIX a revolutionary new interface—one that is both visual and intuitive. Now computer users of every level can instantly wield this tremendous power, with no technical knowledge whatsoever.

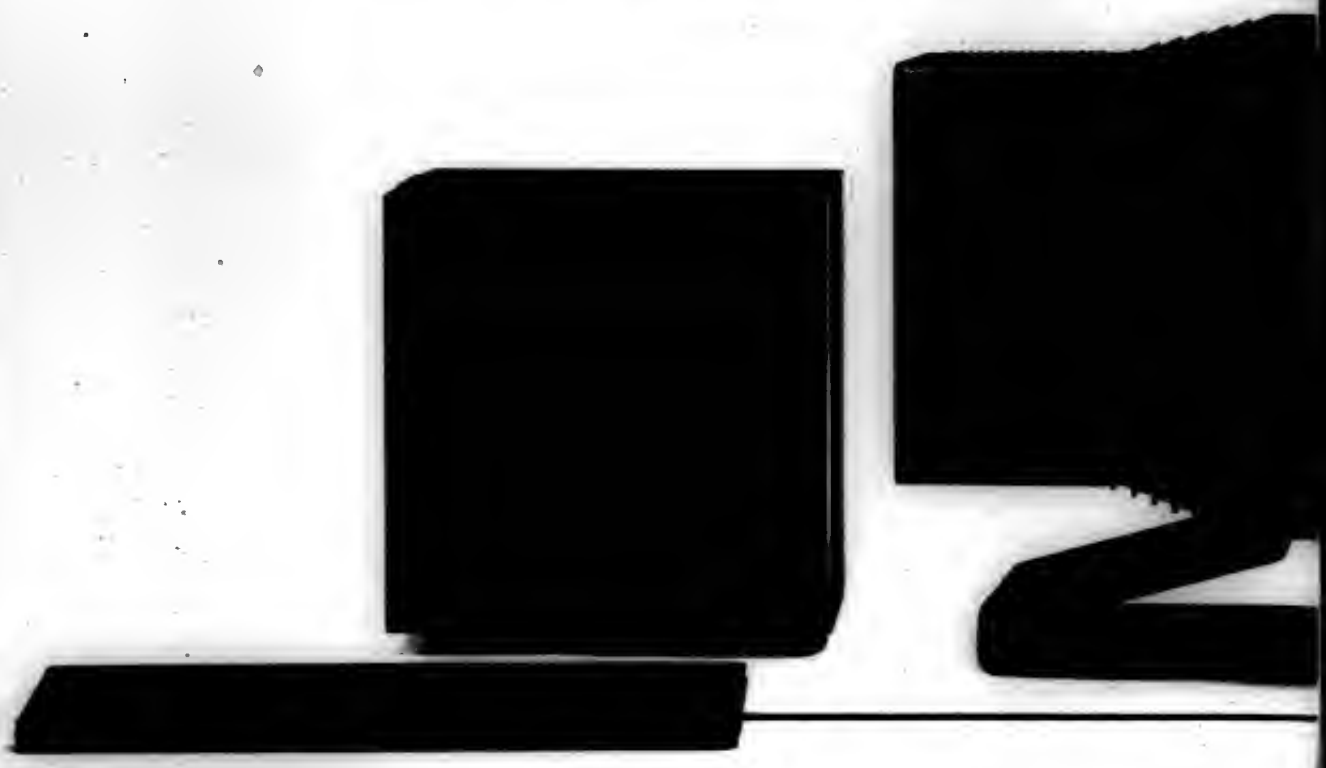
3 To achieve the power needed for the 90s, NeXT bypassed traditional workstation architecture and went directly to that of a mainframe. This eliminates bottlenecks and attains an extraordinary level of system "throughput"—the true measure of computer performance. Only through the use of VLSI (Very Large Scale Integration) technology could this architecture be reduced in size so that it could fit inside a desktop computer. It's a mainframe on two chips.

4 While PostScript* has long been the industry standard for printing, NeXT has made it fast enough to also be used on the display. This "unified imaging model" ensures that what you see on



the display is precisely what you will get on paper. All your work, in any size type and any degree of rotation or magnification, appears with perfect 92-dots-per-inch clarity on the NeXT MegaPixel Display. And with laser precision at 400 dpi on the NeXT Laser Printer.

IN THE 90s, WE'LL
ONLY TEN REAL BREAKTH
HERE ARE SEV



5 The NeXT Computer System is the first to be capable of producing CD-quality sound. Without requiring any additional equipment. This feat is made possible by a chip that has been specifically designed for the task of manipulating sound—the Digital Signal Processor (DSP). Because this processor is standard in every NeXT machine, software developers will be able to call upon its power to enrich programs we use every day. Now computers will not just be seen, but heard.

6 NeXT Mail takes electronic communications beyond anything you've seen on a personal computer before. Now you can send and receive multimedia mail—including text (with varied type fonts, styles and sizes), graphics and voice messages. And despite its high level of sophistication, NeXT Mail is so intuitive, you may not ever need to open the manual. NeXT Mail is built into the system, along with Ethernet and TCP/IP, so the NeXT machine can quickly become a part of existing networks.

7 Programmers can create software on the NeXT Computer up to ten times faster than on any other computer—the result of a breakthrough called NextStep.® It gives software developers the power to create the graphical user interface portion of their applications (often the most time-consuming and difficult part) without any programming at all. This revolutionary environment means we will see more programs, and better ones, in less time than ever possible before.

These seven breakthroughs will change the way we use computers in the 90s. Which is why Businessland, the leading supplier of computers to corporate America, chose the NeXT Computer System as the workstation they will offer. Call us at 800-848-NeXT, and we'll send you a 28-page brochure describing the NeXT Computer. We'll also give you the address of your nearest Businessland Center. There, you can experience for yourself the first seven breakthroughs of the 90s. And get a good idea where the next three will come from.

L PROBABLY SEE ROUGHS IN COMPUTERS. EN OF THEM.

© 1989 NeXT, Inc. NeXT and the NeXT logo are trademarks of NeXT, Inc. NextStep is a registered trademark of NeXT, Inc. PostScript is a registered trademark of Adobe Systems, Inc. UNIX is a registered trademark of AT&T.

BUSINESSLAND

Can Your Computer Vendor Get You Into 1990s Applications Before The '90s Are Over?

Open, Cooperative Computing.
The Strategy For Managing Change.
Coming February 1990.

NCR

Database helps keep Roadway shipshape

ON SITE

BY ROBERT MORAN
CW STAFF

AKRON, Ohio — Roadway Express, Inc. moves freight, but its subsidiary, Summit Information Systems, moves its information.

Summit Information Systems, based in Akron, monitors the firm's shipments through an IBM Systems Network Architecture (SNA) network that supports AT&T minicomputers, two IBM 3090s running MVS/XA and its key piece, the Model 204 database management system from Computer Corporation of America (CCA), in Cambridge, Mass.

At its simplest level, the network monitors about 50,000 shipments each day, with many deliveries containing multiple pieces of freight that move in and out of its 33 hub operations and 600 nationwide field locations.

The origin of the pieces

But the process is complicated by the company's method of combining freight based on origin and destination. As the freight and the trucks that haul it are dispatched, sites collect information and monitor the status of each shipment. From pickup to delivery, each piece travels about 1,000 miles in about four days. Along the way, information about the shipments is keyed into or — using bar codes on its freight control documents — scanned into AT&T minicomputers as freight is combined, broken down and recombined.

"Data needed at any of those facilities may come from or be created at any of the other facilities," said John Pavlov, president of Summit. "We need to manage the data with speed and reliability so the required information can get out to people in our operating facilities in time for them to do what planning and preparation is required to handle their jobs."

The key to the company's shipment monitoring is the Model 204 relational DBMS, which resides on an IBM 3090 Model 400 and is accessible for testing by a 3090 Model 200.

The Model 400 and the Model 204 database are fed by the company's field locations, which have AT&T Model 3B1s in 400 sites and various-size AT&T Model 3B2s at another 300 sites. "We have a live database that has a history of everything," Pavlov said.

At the local sites, the AT&T minicomputers measure productivity, perform customer service and feed and extract information to and from the database.

The firm keeps its on-line systems running around the clock, with most on-line activity occurring at night. Running the batch processing on the same machine, the firm has to squeeze it in throughout the day and manage the resource contention.

"The Model 204 has provided us with the ability to handle our volume of transactions in a very short processing time — overnight — and has given us the ability to link together a number of databases into an overall database," said Gerald Long, the company's director of systems development.

The company previously used IBM's IMS database system and benchmarked the Model 204 against IBM's DB2, which "couldn't handle the transaction rate," Long said. He attributed the Model 204's success to a search algorithm that is structured to retrieve large volumes of data quickly. As a result, the Model 204 serves a strategic role — supporting freight handling and as a feeder to internal applications — and DB2 serves the more traditional support applications, he said.

The company shares files between the Model 204 and DB2. According to Long, CCA is working on a more effective bridge between the systems.

Customers can also monitor the status of shipments through personal computers or the firm's voice-response system, which Pavlov said handles well over one million calls per year.

Summit's Pavlov *utilizes systems that speed freight handling*

Using Touch-Tone phones, customers tap in purchase order or bill of lading numbers and receive a voice response about the precise trailer, its location and its expected arrival time.

A single bill look-up takes about five seconds — no faster than its older system, Long said. But the older system delivered information that was six to eight hours old, while the new system gives the current status of shipments — a direct result of the Model 204's on-line capability, he said.

In addition, the company uses subsets of the shipment database for its internal planning and service analysis. The database also feeds a separate accounts receivable application.

According to Long, the first application for tracking basic shipments took about 10 months to develop, including training time, and was installed in April 1987. The systemwide installation for corporate offices was installed in February 1988.

Graphical user interfaces emerge to vex developers

BY AMY CORTESE
CW STAFF

Graphical user interfaces (GUI) are just now entering the scene, promising to make user-friendly systems a reality.

However, for developers used to character-based terminals, programming for a graphical environment can be a nightmare and consume up to 80% of development resources. Compounding that problem, developers must choose among several GUIs on the market competing for standards status.

It is the classic chicken-and-egg problem, according to Bill Osberg, director of database development at Unify Corp. While workstations and terminals supporting GUIs are becoming less expensive, there is still no software to take advantage of them.

However, developers are hesitant to invest in a particular GUI at this point for fear they may choose the wrong one. Many point to the dilemma faced by Lotus Development Corp. as one example of risk-taking. The maker of 1-2-3 put a major effort into development for IBM's OS/2 platform, only to find that users are content to run Microsoft Windows under DOS.

"They guessed wrong, and they're paying for it now," Osberg said. "It's just not clear yet what development environment will be the one most people will use."

Meanwhile, software developers are responding with innovative approaches that they hope will make GUI debates irrelevant and speed up delivery of the next generation of graphically oriented applications. One example of how vendors are designing generalized interfaces is Oracle Corp.'s recent announcement that it will support multiple GUIs.

Similarly, Unify provides a tool called Accell CP. A developer can write an application to Accell's presentation interface and run it on any platform that Accell supports. The current release of Accell supports Microsoft Windows as well as character-based presentations, and the company has announced Open Look support for the first quarter of 1990.

Other vendors are moving in the same direction. While he would not comment on specific product plans, Mark Hanner, manage of application development at ingres Corp., said, "Ultimately, that's the way everyone will go."

However, some users said the current vendor moves offer only interim solutions, and the users still face the decision of which GUIs to invest in. Gary Lehr, a staff specialist at Du Pont Co., said that such a strategy is "too much of a mainframe approach."

But for large companies that may use many GUIs, these products will make life much easier. Ken Wedig, manager of engineering systems at John Deere & Co., said his firm will use OSF/Motif, Digital Equipment Corp.'s Decwindows, the Apple Computer, Inc. Macintosh user interface and IBM and Microsoft Corp.'s OS/2 Presentation Manager. "What we're looking for is portability so we don't have to choose," Wedig said. "The whole point of open systems is not to be tied to a particular platform."

Say goodbye to error-prone manual verification and costly reruns. Let Unitech Systems ensure that your first-run reports are accurate. Our U/ACR automated report balancing software can capture and verify counts, dollar amounts or text from any application—all without program changes or hooks in your MVS or VSE operating system.

And we're offering more rule-based solutions, including:

- High-speed matching and reconciliation of transaction records.
- Automatic data set validation before processing.
- Exception reporting and trend analysis of critical production data.

For total information integrity, you can always count on Unitech Systems. Call us at 800/842-3000.

UNITECH SYSTEMS, Inc.
Software Products and Services
3030 Warrenville Road,
Lisle, IL 60532
708/505-1000

Total Information Integrity Products

We've Gone To Extremes To Give You Just The Terminals You Want.

No matter what you're looking for in a terminal, our new 935 and our 965 are the wisest choices you could make.

Both are extremely reliable, with single-board design and surface mount technology, backed by a one-year limited warranty. Both give you incredibly clear, crisp images, on 14-inch, flat, non-glare screens. And both swivel and tilt, with detached, two-position keyboards for user comfort.

The 935 is the most flexible low cost ASCII terminal available. You get 40 programmable editing keys, 32 programmable function keys, a fully programmable numeric pad, 80 or 132 column display by 24 lines, 2 pages of memory, 9 ASCII emulations. And more.

The 965 is everything you could want in a terminal. ASCII, ANSI, or PC terminal operating modes. 23 terminal emulations. 128 programmable function keys. Up to 7 pages of memory. Multiple display formats up to 49 lines by 132 columns. Interactive on-screen calculator. VideoDesk™ accessories. And more.

For more information fast, call toll-free or write today.
TeleVideo Systems, Inc., 550 East Brokaw Road, P.O. Box 49048, San Jose, CA 95161-9048.

Because we'll go to extremes to make terminal users, OEMs and VARs happier.

TeleVideo®
American Ingenuity. TeleVideo Know-How.

Call 1-800-835-3228

© 1989 TeleVideo Systems, Inc. TeleVideo is a registered trademark, and VideoDesk is a trademark of TeleVideo Systems, Inc.

SEE US AT COMDEX, BOOTH #802

VMS 9000

CONTINUED FROM PAGE 25

The 9000 hardware and the new version of VMS can combine to increase previous disk-access time tenfold from 30 I/O per second to 320 I/O per second, Whitman said.

The new operating system is known in-house as "Aetna," after its beta-test site at Aetna Life and Casualty Co. in Hartford, Conn. While earlier versions of the operating system will not run on the 9000, the 9000's VMS release will run on all previous machines, and users of early versions can upgrade under their maintenance contracts.

There are already some 6,500 VMS applications for VAX systems, and all of them will run on the VAX 9000.

What seems to draw the greatest acclaim for the VAX 9000 system is its increased I/O bandwidth, which helps to position it for transaction processing, high-volume batch processing and other commercial applications.

Vector processors, available for both 6000 and 9000 systems, will accelerate the performance of computing-intensive applications such as seismic analysis and weather modeling from three to 10 times, depending on the application.

"The 9000 gives us the opportunity to grow our Powerhouse-based applications to mainframe-class size without porting to another mainframe," said Harley Shouldice, product marketing manager for Cognos, Inc.'s Powerhouse fourth-generation language.

The raw power of the new mainframe also promises "significant performance boosts," he added. "Conservatively speaking, there will be 10 to 20 times the disk I/O throughput with this new machine."

Applications that are already "tightly integrated" with the VAX architecture are in the best position to benefit from the new features of the 9000's operating system, Shouldice noted.

"The fact that memory capacity is dramatically increased [to 512M bytes] gives typical time-sharing applications a higher performance rate," Shouldice said.

Another improvement in the operating system came from placing the commercial instruction set in microcode, "which sped up the internal processing," Shouldice said.

Northern Trust Co. in Chicago will consider purchasing a VAX 9000 next year, primarily to run two trust management applications.

The applications, written in the MUMPS language, cannot run in a multiprocessor environment and are straining the capacity of Northern's largest VAX 8000, said Robert Tanner, senior vice-president of the trust and financial service business unit at Northern.

The company now has six VAXes in a cluster, making it the largest financial installation of VAX equipment in Chicago, Tanner said.

The IS manager said he would like to have the new release of VMS take charge of disk updating from his primary database to another database established for customer inquiries.

Tanner also struggles with a daily log-jam of requests to his database from his largest employee-benefits customers, who sign on to pull off reports that may gobble up 15-20 minutes of the computer's time.

"That is a huge glut of activity for us every day. We're using up almost all the capacity of a 50-plus-MIPS cluster environment," Tanner explained. "In order to keep that activity from deteriorating our response time, I'd rather have that on a separate machine, but with information just as current as the primary database."

A combination of front-end and back-end database management and improved disk shadowing "would give us lot of advantages," he said.

Tape-drive

CONTINUED FROM PAGE 25

long as it did with his System/38s. When IBM introduced the AS/400, it offered users the 2440 drive and the promise of an attachment that will allow them to use the 3422 drive with AS/400s in the future. This setup required many System/38 users to temporarily shelve their 3422s and install 2440s until the 3422 attachment became available. The other option was to not re-install the 3422 and go directly to the new generation, the 3490.

Voloshin had been using a 3422-like drive, the Memorex 3261. When the 3422 attachment became available, he was able to reinstall his 3261s. That improved backup time somewhat and newer drives would boost it even more. However, now he is in no rush to pick up new drives.

"Everyone's calling us now," Voloshin said, "so we'll sit back and wait."

Rick Pinkos, IS manager at D'Arcy Masius Benton & Bowles, Inc., an advertising agency in Bloomfield Hills, Mich., is another user who can take his time selecting a new drive. Instead of waiting for vendors to deliver a better product, Pinkus instituted several procedures, such as journaling, to trim backup times with the 2440.

The new procedures worked so well that Pinkos can no longer justify the cost of the IBM 3490. "We cut down on the amount of backups required to the point where we looked at the 3490 and decided it really wasn't worth it," Pinkos said. "We'll look for the next 3490 over the next year or so."

Win a free trip to Communication Networks '90

And get all the details on America's premier communications conference just by entering.

Next February, a major event in voice and data communications will take place in Washington, D.C. In just four days, you will be able to gather the latest, most up-to-date information on the fast-changing world of communications at the 12th annual Communication Networks '90.

Fifteen in-depth tutorials will cover everything from "Integration and Connectivity" to "Regulatory Issues in Telecommunications." More than 80 conference sessions will bring you up-to-date on subjects like LANs, Network Management, High Band-Width Transmission, ISDN, Standards, Security and Inter-enterprise Networking. And 400 industry-leading exhibitors will give you information about their newest communications products and services.

Selected by the Department of Commerce for the second year in a row to participate in its elite Foreign Buyer program, Communication Networks '90 will give you access to the entire world of voice and data communications technology. As one of the winners of our contest, you could win a free trip to this unique event.

Just send in the form to enter.

When you complete and return the form below, we'll make sure you get complete details on Communication Networks '90 as they become available. AND, we'll automatically enter you in our contest for one of these three prizes:

1. Free air fare, hotel and conference admission. As First Prize winner you will get round-trip airfare from your nearest major airport, three nights at the luxurious Grand Hyatt Hotel, free admission to three days of conferences and the exposition, plus your choice of one day-long, in-depth tutorial. Approximate total value: $1,875.
2. Free accommodations and conference admission. Second Prize winner will receive three nights accommodations at the Grand Hyatt, plus one in-depth tutorial and free admission to the full conference and exposition. Approximate total value: $1,375.
3. Free conference admission. Third prize, valued at $895, includes your choice of one day-long, in-depth tutorial and full conference and exposition admission.

There's no way you can lose!

Whether you win a prize or not, you win. You will get information on a conference and exposition that can give you the expertise you need to stay ahead of your competitors. Send in the form today, or FAX it to 508-872-8237.

Summary of Contest Rules

Entry Form must be filled out with *all* information requested and received at the address shown NO LATER THAN November 30th, 1989. One entry per person; one prize per person. No registration is required to enter, but if you win after you have registered, you will receive a full refund. Winners will be chosen at random and announced on December 15th, 1989. Decision of the judges is final. All residents of the continental U.S. and Canada 18 years or older are eligible, except employees of International Data Group, its agencies, affiliates or subsidiaries. Winners must consent to the use of their names and photographs in contest publicity.

For a copy of the complete contest rules, or a list of winners, send a self-addressed stamped envelope to Communication Networks '90, P.O. Box 9171, Framingham, MA 01701.

COMMUNICATION NETWORKS
CONFERENCE & EXPOSITION

Taking Networking into the 90's

Washington, D.C. • February 5-8, 1990

Please enter my name in your Communication Networks '90 contest and send me full details about the conference and exposition. I understand I must fill in this form completely in order to be eligible.

Name _____ (please print or type)

Title _____

Company _____

Address _____

City _____ State ____ ZIP _____

Telephone (____) _____

FAX (if available) (____) _____

List the five communications/networking topics in which you are most interested:

1. _____
2. _____
3. _____
4. _____
5. _____

CW01

When filled in completely, mail to:
Communication Networks Contest
P.O. Box 9171, Framingham, MA 01701-9171

How we helped improve the performance of the new BMW.

There's a sleek new shape on the landscape. A gleaming testament to the fine art of engineering. It's the new North American headquarters of BMW. ROLM But like all things BMW, the real power lies under the hood. At the heart of the communications system—the 9751 CBX from ROLM. Why *ROLM*, of all the systems they could have chosen? It began with a set of expectations. A voice message system that was simple to use. ROLM An installation that wasn't a nightmare. Service and support they could count on. All the things they assumed they could get anywhere. But which, surprisingly, only one company had: ROLM. The installation went so smoothly that BMW's normal, efficient operations never hit a bump. ROLM On the first day in the new building, every phone had dial tone, every computer display was aglow. Before long, PhoneMail had become an everyday part of doing business, from the board room to the mail room. But even with all this, a feature that wasn't even on their list of expectations turned out to be the clinching factor: ROLM's association with IBM. This combined expertise in voice and data offered benefits no one else could match. ROLM Voice/data integration, up-to-the-minute solutions and a solid link for the long term. A long term that includes the technology of Siemens, a world leader in ISDN. These days, there's a new standard of performance at BMW. You'll find it parked on every desk: ROLM. ROLM

An IBM and Siemens Company. 1-800-624-8999, ext. 235

BMW's use of ROLM and IBM's products does not constitute an official endorsement. © 1989 ROLM Company

SOFT NOTES

Andersen adds to Foundation

Andersen Consulting recently extended its Foundation computer-aided software engineering products to include a version for the Bull environment. Foundation for Bull platforms will be generally available in Europe the first quarter of 1990, the firm said.

Transarc Corp. in Pittsburgh, Pa., said its first product, Transarc AFS, a distributed file system for networks of Unix systems, will be available March 1, 1990. AFS incorporates technology developed at Carnegie Mellon University under a joint CMU-IBM project. IBM made an equity investment in the start-up earlier this year.

Oracle Corp., in conjunction with **Pyramid Technology Corp.** and **Independence Technologies, Inc.**, recently announced the integration of Version 6 of the Oracle DBMS with ITI's Transaction Manager to provide a multithreaded, multiserver Unix DBMS for Pyramid's MIS-server line of servers. The multithreading capability increases the number of users per server. The product will be jointly marketed by Oracle and ITI, with "limited production release" this month.

Fourgen Software, Inc. in Edmonds, Wash., has signed a marketing agreement with IBM under which IBM will market the firm's accounting applications for IBM's AIX-based systems. The agreement marks IBM's first for AIX-based accounting software, according to Fourgen.

Integrated Computer Solutions, Inc. in Cambridge, Mass., recently began shipping the Open Software Foundation's Motif graphical user interface for Sun Microsystems, Inc., Digital Equipment Corp., Sony, and Apple Computer, Inc. platforms. The firm says it is the first vendor-neutral source for Motif offering the interface for use on various platforms with various software applications.

Moran

CONTINUED FROM PAGE 25

encumbered by the nonstructured methodologies of Cobol development, they permit the end users to program, although the worth of the end users' labors to the enterprise has been immeasurably questionable.

Indeed, the 4GL folks have recognized such and have legitimately touted a crucial benefit of their tools: In the hands of expert developers, 4GLs quickly generate application prototypes.

Sokol argues that the tools only offer programmers "a shorthand for writing applications which fit into certain molds."

Further, the speed often touted for the 4GL is lacking in many of the interpretive 4GLs — a method that examines each line for errors as it is written rather than compiling the program first and examining it second.

To kill Cobol takes clout, which can be achieved only with the collective might of standardization.

At present, the programmers and developers skilled in 4GLs cannot rival the number of programmers and developers in the Cobol world.

"The problem can be solved by the development of a 4GL standard or the emergence of one particular 4GL which can be licensed to multiple vendors for multiple platforms," Sokol said. "Only then will 4GLs have a large enough base of programmers to rival the staffing situation in the 3GL [Cobol] world."

Such a standard is not likely any time soon. Hence, in my estimation, neither is the likely death of Cobol, which is some 70 billion lines strong, with a wealth of programmers administering to them, to say nothing of the corporations employing them.

Instead, the 4GL proponents are in the anxious stage of the historical curve. Having sketched out plans to prepare their wares for the intricacies of distributed processing, they acknowledge that they will first tinker with their tools to fulfill the requirements of cooperative processing.

A mere formality, because, they argue, the 4GLs embrace IBM's SAA, particularly the common user access's guarantee of a common look and feel. The screen management done, they will necessarily preserve the intricacies that differentiate them from their competitors and will have their tools running on any server known to man and exchanging data — transparently — up, down, around and through networks.

Their forces, thus, are scattered, and their real adversaries are not Cobol but the toe-to-toe battles among themselves. In any event, heightened language is neither sharp nor weighty enough to do the deed to Cobol.

Of course, Cobol's death has been forecast numerous times, but the collective weight of the Codaysl Cobol Committee, itself not known for speed, has launched an effort to bring software modeling techniques in object-oriented languages into Cobol. Codaysl is an industry organization whose recommendations are often adopted into ANSI standards.

Other issues notwithstanding, if the effort proves successful this month, its weight will help to keep the 4GLs in their niche.

FLEXIBLE ▪ RELIABLE ▪ EXPANDABLE

Direct Channel Attached Protocol Converter/Controllers From JDS MICROPROCESSING

Direct channel attached HYDRA communication products provide superior flexibility. They allow local or remote PCs, ASCII terminals, ASCII printers, and many other ASCII devices to communicate with mainframe applications. Users can dial-in and access mainframe databases and electronic mail, check on mainframe operations, transfer files and retrieve reports. And, regardless of the application, you can feel secure. Multi-level password security, postitive log-off security, and call-back security can be custom configured to suit your requirements.

More than ten thousand ASCII devices located in large and small data processing centers depend on the reliability that JDS products provide. Transportation, financial, manufacturing, retailing, engineering, government and educational institutions are among various industries that rely on channel-attached HYDRA products for their ASCII connectivity solution.

Best of all, JDS products expand to meet the demands of your connectivity needs. Support for as few as four ASCII devices or as many as 64 ASCII devices per HYDRA is available. As your company grows, you can upgrade any model to support up to 64 devices and then attach multiple HYDRAs.

JDS MicroProcessing's line of HYDRA products attach to IBM and compatible 43XX/30XX and 9370 CPUs. To discover more about JDS MicroProcessing products call **800-55-HYDRA**. In California call **(714) 770-2263.**

JDS MICROPROCESSING
22661 Lambert Street, Suite 206, El Toro, CA 92630

In Europe contact Communications Solutions Ltd. Ph: England (932) 231-466

HYDRA is a registered trademark of JDS MicroProcessing.
IBM is a registered trademark of International Business Machines.

End users see fruit of Sybase link

BY JEAN S. BOZMAN
CW STAFF

BURLINGAME, Calif. — Sybase, Inc.'s new Open Server architecture [CW, Oct. 9], which is designed to link Sybase Release 4.0 with database management systems made by other vendors, is beginning to ship to end users.

Versions for Sun Microsystems, Inc. and Digital Equipment Corp. systems began shipping last month, Sybase executives said recently.

Looking beyond that, Sybase managers previewed some future features, many of which will not be available until mid-1990 or later. Speaking at an October Sybase users' meeting here, the executives outlined the pending product enhancements to approximately 400 users.

In addition, some of the same features were also discussed with Sybase's European subsidiaries and European distributors when Sybase executives later visited Paris.

An OS/2 version of the Open Server is expected to be released in the second quarter of 1990, Sybase managers said. Connectivity between that server and IBM's DB2 is scheduled for later in the year, Sybase sources added.

> "IT DOES TAKE a while for OS/2 technology to be developed. We shared the technology that is under active development with our users, but we have not formally announced those things yet."
>
> RICHARD SCHEFFER
> SYBASE

However, details about these features and others were scarce. "It does take a while for OS/2 technology to be developed," said Sybase director of marketing Richard Scheffer.

"We shared the technology that is under active development with our users, but we have not formally announced those things yet."

Some Sybase users have already begun to push ahead with Open Server applications. Dirk Epperson is the IS director at Artsoft, Inc., an Emeryville, Calif., firm that builds ticketing systems for groups such as the American Conservatory Theatre and the Philadelphia Orchestra. Artsoft is an early-release Open Server user.

"We were spending a lot of time trying to port our third-generation languages to different hardware platforms," Epperson said. "We wanted to piggyback somebody's DBMS to all the platforms, and that's what we're doing with Sybase."

Artsoft has programmed Open Server to seek data in a number of relational DBMSs belonging to different ticketing services. The advantage of this approach is that no users are locked out as multiple queries are made and that updates are broadcast throughout the network.

Like Artsoft, many new Sybase users are often second-time RDBMS buyers, said Sybase founder Bob Epstein, who is now executive vice-president. That means marketing must be aimed at Sybase's ease of use compared with DBMSs made by competitors Oracle Corp. and Relational Technology, Inc. Sybase claims to have at least 1,000 Sybase sites worldwide.

However, Sybase, with 500 employees and $15 million in quarterly sales, is just a fraction of the size of $600 million competitor Oracle Corp. — and Sybase has yet to make a public stock offering. In order to grow, Sybase is zeroing in on lower-cost local-area networks and workstations and leaving the high-end systems to IBM and Oracle.

"We're going after the price-sensitive applications," Epstein explained.

"WITH KELLY COMPUTER TEMPORARIES, WE GET PROFESSIONALS WHO GET THE JOB DONE WITH ACCURACY."

IF YOU HAD THE FORESIGHT TO BUY NAS, YOU'RE IN GOOD COMPANY.

INTRODUCING HITACHI DATA SYSTEMS.

You chose National Advanced Systems for our high-performance industry-standard mainframes and storage systems. As a result, you gained the best reliability and service in the business.

You made the smart choice, and you're not alone: NAS has now become Hitachi Data Systems.

That means we're fully backed by Hitachi Limited, a world leader in the design and manufacture of mainframe and storage systems and one of the largest electronics companies in the world.

Together we firmly believe the industry-standard mainframe and storage market needs more than a single large supplier. It needs a supplier that can combine performance, reliability and service with security and dependability.

So Hitachi Limited — a company of $48 billion in revenues and $3 billion in R&D — has put its money, resources and reputation on the line to ensure our success as Hitachi Data Systems.

We're going to make a big difference in your business. Because the smart choice is now the safe choice.

Hitachi Data Systems, 750 Central Expressway, P.O. Box 54996, Santa Clara, CA 95054-0996. Tel (408) 970-1000.

HDS

Hitachi Data Systems

NEW PRODUCTS — SOFTWARE

Training

Computer Systems Research, Inc. has released maintenance updates for courses in its MVS/JES2 System Operation and Problem Resolution series.

Five courses reportedly have been updated to reflect an IBM Enterprise Systems Architecture-level of operation and to achieve currency with IBM MVS Release 2.2. The revisions are formatted on eight disks, and three reference books are included. The price for the JES2 series is $8,100, and the MVS Internals are available for $35,880.

Computer Systems Research
P.O. Box 45
Avon Park South
Avon, Conn. 06001
203-678-1212

Compilers

Oregon Software, Inc. has introduced a port of its Oregon C++ compiler for Hewlett-Packard Co.'s HP9000 Series 300.

The latest implementation is reportedly shipped with a source-level debugger, a complete ANSI C library and a library compatible with the AT&T stream I/O library for C++. A single-user license will be available for $1,900.

Oregon Software
Suite 200
6915 Macadam Ave.
Portland, Ore. 97219
503-245-2202

MBP Software and Systems Technology, Inc. has enhanced its Visual Cobol native code compiler program based on the ANSI-85 Cobol standard.

Version 2.0 offers support for Novell, Inc.'s Netware and the IBM Personal Computer Network, the firm said, and is available for Intel Corp. 80386- and Motorola, Inc. 68000 series-based systems running AT&T's Unix System V or Microsoft Corp.'s Xenix/386 operating system. The release also runs on Unisys Corp. systems with CTOS VM or BTOS II software. The single-user list price is $1,195. Volume discounts and site licenses are available.

MBP Software
Suite 260
Alameda, Calif. 94501
415-769-5333

HCR Corp., which in June 1989 announced a packaged C++ compiler based on AT&T's Unix System V Release 2.0, has unveiled its HCR/C++ for The Santa Cruz Operation's Unix System Version 3.

According to the vendor, the latest release will provide SCO Unix programmers with both compiling and debugging facilities linked with an Intel Corp. 80386-based platform.

The release sells for $995, with discounts of $300 per copy available until Dec. 31, the company said.

HCR
10th Floor
130 Bloor St. W.
Toronto, Ont., Canada M5S 1N5
416-922-1937

Sablesoft, Inc. has announced an enhancement product for IBM's Query Management Facility that automatically compiles QMF report forms into an OS/VS Cobol or VS Cobol II program in approximately seven seconds.

Called Compile/QMF, the software uses static SQL to simplify security administration and increase CPU efficiency, the company said. The program reportedly can run reports in batch or interactive modes under CICS or TSO. A perpetual license ranges from $9,000 to $16,900.

Sablesoft
2695 Winding Trail Drive
Boulder, Colo. 80304
303-443-7791

Computer-aided software engineering

Manager Software Products, Inc. has announced an enhanced release of its Manager Family of Program Products, specifically designed to enable businesses to migrate to IBM's DB2 relational database environment.

The computer-aided software engineering tools are based on the firm's Datamanager Corporate/Dictionary Repository, which automatically interfaces to multiple database systems. The release supports users through all phases of design and implementation of DB2 database applications.

Price depends on the operating system.

Manager Software Products
131 Hartwell Ave.
Lexington, Mass. 02173
617-863-5800

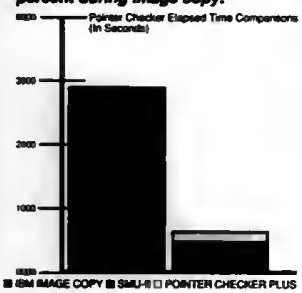
Validate DL/1 Pointers Up to 10 Times Faster

You never again have to worry about pointer errors in your image copies. With POINTER CHECKER PLUS, a new IMS product from BMC Software, you are assured of accurate data base backups every time. POINTER CHECKER PLUS gives you two high-speed options for pointer verification. The Hash Checking Technique takes so little time to run, you can check pointers during every image copy.

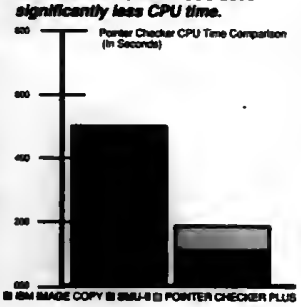
The Full Checking Technique provides an in-depth examination of an existing data base, or an image copy with extensive diagnostic information to help you pinpoint specific pointer errors quicker than with SMU-II. When POINTER CHECKER PLUS runs with BMC's IMAGE COPY PLUS, the image copy process with pointer checking is faster than with any other combination available.

BMC is committed to developing new products for IMS, CICS and DB2. A recent *Business Week* study listed BMC first among American companies in the software and services group for dollars spent per employee for research and development. This investment has led to a growing line of high-performance data base utilities, now including POINTER CHECKER PLUS.

POINTER CHECKER PLUS increases elapsed time by less than five percent during image copy.



POINTER CHECKER PLUS uses significantly less CPU time.



The products in the series run up to 10 times faster than the IMS utilities they replace, and the list includes:

- POINTER CHECKER PLUS
- IMAGE COPY PLUS
- UNLOAD PLUS
- LOADPLUS
- SECONDARY INDEX UTILITY
- PREFIX RESOLUTION PLUS

For more information, or to begin a 30-Day-Plus Free Trial of POINTER CHECKER PLUS or any other product in BMC's Data Base Utilities Series, complete and mail the coupon below, or call BMC Software, Inc., at **1-800-841-2031.**

BMC SOFTWARE

P.O. Box 2002
Sugar Land, Texas 77487-2002
713-240-8800

BMC Software P.O. Box 2002 • Sugar Land, TX 77487-2002
Please contact me about:
Free Trial — More Info
☐ ☐ POINTER CHECKER PLUS
☐ ☐ All BMC Data Base Utilities
Name
Title
Company
Address
City
State Zip
Telephone

POINTER CHECKER PLUS is available from BMC's international offices:
Australia (61) 3 696-5720 — England (44) 276 34622 — France (33) 1 46 77 77 77 — Italy (39) 2 48153860 — Japan (81) 3 837-8851 — West Germany (49) 89 964060

© 1989, BMC Software, Inc. All rights reserved.

DISOSS
ONLINE HUP UPDATE
- Add, Update, Delete, List users
- Works while **DISOSS** is active
- CICS transaction and **PS/CICS** exit
- Free 30-day trial

TBS Software Inc.
249 Tempo Avenue
North York, Ontario
Canada M2H 2A9
(416) 221-6140

System software

Technical Systems Consultants, Inc. has announced Uniflex, real-time operating system software designed for use with Force Computer's CPU-37 single-board Motorola, Inc. VMEbus computer with integrated Ethernet hardware.

The product is said to be AT&T Unix System V-compatible and is targeted for control and data aquisition system developers.

A command shell, hierarchical file system, editor, assembler and debugger are included.

The single-system licensing price is $1,000 for Uniflex/RT and $1,800 for Uniflex/RN with networking.

Technical Systems Consultants
111 Providence Road
Chapel Hill, N.C. 27514
919-493-1451

Database management systems

Ontologic, Inc. has announced Ontos, a multiuser object-oriented database program based on the C++ standard object language.

The product is currently available for Sun Microsystems, Inc. and Hewlett-Packard Co.'s Apollo division workstations and offers support for both C++ and SQL, the company said.

The modular software is reported to be especially suited for computer-aided design and computer-aided manufacturing platforms. It can also be used with network management, computer-aided software engineering and office automation applications, the vendor said.

The product costs $15,000.

Ontologic
3 Burlington Woods
Burlington, Mass. 01803
617-272-7110

Development tools

Unify Corp. has introduced Accell/SQL, a fourth-generation language (4GL) application designed to improve programmer productivity for Oracle Corp.'s Oracle users.

According to the company, the product, which is targeted for Oracle AT&T Unix developers, includes a 4GL as well as an applications generator. It also is said to offer a cooperative processing option that offloads user I/O processing from a Unix host to DOS-based personal computers.

Pricing for the software ranges from $1,500 to $140,000, depending on system size and configuration, the firm said.

Unify
3870 Rosin Court
Sacramento, Calif. 95834
916-920-9092

Template Graphics Software, Inc. has announced the introduction of its PHIGS command interpreter (PCI), a front-end option that is designed for use with Figaro+, the company's PHIGS-based graphics software package.

PCI reportedly allows users to enter and execute Figaro+ commands interactively, with no programming required. According to the company, the product can be used for prototyping, debugging and application development.

It is said to support Digital Equipment Corp., Hewlett-Packard Co., Sun Microsystems, Inc. and various other vendor environments.

Pricing starts at $750 per copy on a workstation platform, the firm said.

Template Graphics
3510 Dunhill St.
San Diego, Calif. 92121
619-457-5359

Applications packages

Project Systems Consultants, Inc. has introduced Cascade, a desktop management software system that has been designed for the AT&T Unix operating environment.

The system is said to be an interactive, graphics-based workstation tool for project management and performance measurement. The program reportedly supports the cost/schedule control system criteria based on the U.S. Department of Defense's guidelines for managing major government projects.

How your mainframe can hop from New York to Tokyo in two seconds.

AT&T Paradyne

Cascade is currently available for Hewlett-Packard Co. and Sun Microsystems, Inc. workstations.

The product is priced from $30,000.

Project Systems Consultants
Suite 300
2450 Fondren
Houston, Texas 77063
713-974-1155

Pride-Tech, Inc. has announced a version of its Life/Health Administration system developed specifically for the IBM Application System/400 series.

Targeted at the life and health insurance market, the software was designed with ANSI-standard Cobol to be fully compliant with IBM's standards for Systems Application Architecture, the company said.

It reportedly will run on all AS/400 models and carries a $250,000 license fee.

Pride-Tech
Suite 1458
10 S. Riverside Plaza
Chicago, Ill. 60606
312-454-0020

Utilities

Legent Corp. has announced Release 2.0 of its Multi-Image Manager, a product for sharing resources in multiple-image environments.

The software was designed for sites with two or more physical CPUs running IBM MVS or VM, or sites with CPUs logically partitioned under IBM PR/SM, VM or Amdahl Corp. MDF. It includes an improved user interface and the ability to dynamically change control parameters. It also offers an alternative communications method between systems via high-speed channel-to-channel devices.

Annual lease pricing is based on CPU class and starts at $10,900.

Legent
8615 Westwood Center Drive
Vienna, Va. 22182
703-734-9494

Questcomp, Inc. has announced a database utility developed for use with the IBM Application System/400 and System/38 families of midrange computers.

Questview was designed to give systems analysts and programmers the ability to view and update database files without prior compiling or specifications. Users can also generate customized inquiry programs that can be moved to end-user application systems, the firm said. The software is priced from $995.

Questcomp
Suite 720
19800 MacArthur Blvd.
Irvine, Calif. 92715
714-851-0305

Artificial intelligence

Inference Corp. has announced two versions of its ART-IM expert system building tool based on Digital Equipment Corp.'s Decwindows technology.

Designed to run on DEC VAX computers and Decstations running VMS and Ultrix, ART-IM/VMS Version 2.0 and ART-IM/Ultrix are hybrid rule- and object-oriented tools that can be used for building information-intensive, knowledge-based applications, according to the company. Each product is delivered on a single DEC TK50 tape.

Pricing ranges from $10,000 to $60,000 for development. Volume discounts are available.

Inference
5300 W. Century Blvd.
Los Angeles, Calif. 90045
213-417-7997

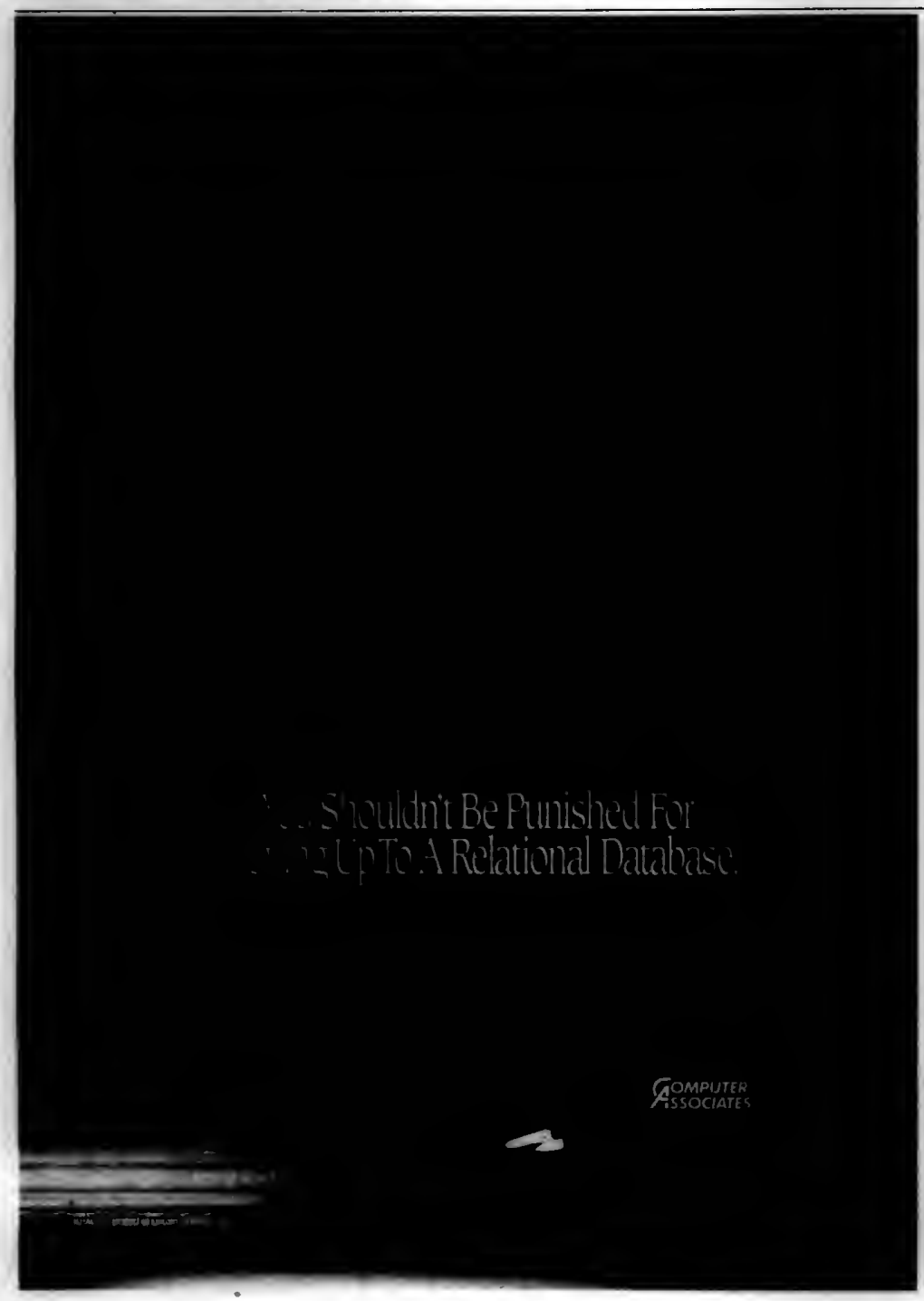
Berkshire Software Company has announced Neuralog, a neural network tool that is implemented in Borland International's Turbo Prolog.

According to the company, the product can be used for education and training, research, or exploration, as well as the actual development of neural network applications.

The program employs the back propagation algorithm, and network weights can be stored and retrieved, according to the vendor.

It requires an IBM Personal Computer or compatible, and a single-copy license is priced at $149.

Berkshire Software
44 Madison St.
Lynbrook, N.Y. 11563
516-593-8019



NEW PRODUCTS — SYSTEMS

Processors

Tasco Electronic Services, Inc. has introduced the MVS-1700, a multiprocessing system that is fully compliant with MIL-STD-1750A Notice 1 instruction set architecture.

The system is reportedly based on the Motorola, Inc. VMEbus and can be upgraded with off-the-shelf VMEbus-compatible modules. It incorporates a proprietary single-board computer that runs at a clock speed of up to 40 MHz and can be configured with a 44M-byte removable cartridge disk, the vendor said.

The product is priced from $16,000.

Tasco Electronic Services
Suite B
2121 W. Crescent Ave.
Anaheim, Calif. 92801
714-635-0550

Opus Systems, Inc. has announced a portable Unix workstation and multiuser system based on reduced instruction set computing technology.

Called the Portable Mainframe, the system reportedly operates at 21 million instructions per second and is available in portable and stand-alone desktop versions. It features an 88000-based, 20- or 25-MHz dual-processor subsystem and allows AT&T Unix and MS-DOS to run simultaneously in native modes.

The Portable Mainframe carries an authorized dealer price of $13,995.

Opus Systems
Building 400
20863 Stevens Creek
Cupertino, Calif. 95014
408-446-2110

Data storage

IPL Systems, Inc. has announced a 16M-byte main storage expansion card developed for the IBM Application System/400 Model B70.

The surface-mounted memory card can be installed by the user and does not require operating system modifications, the vendor said.

The product is compatible with IBM Application System/400 Models B30 through B70 and is priced at $20,000.

IPL Systems
360 Second Ave.
Waltham, Mass. 02154
617-890-6620

Emulex Corp. has released two small computer systems interface (SCSI) host adapters created specifically for Digital Equipment Corp. Unibus systems.

The UC17 and UC18 are standard quad-wide modules that offer compatibility with DEC's Digital Storage Architecture, the vendor said. The UC17 is a single controller with one SCSI bus port that supports up to seven SCSI disks or up to seven SCSI tape devices. A single SCSI port can provide more than 14G bytes of unattended backup. The UC17 costs $1,800.

The dual-controller UC18 incorporates two SCSI ports, each operating independently of the other, according to the company. One UC18 can support up to 14 devices, in seven tape and seven disk, 14 tape, or 14 disk configurations. The product is priced at $2,250.

Emulex
P.O. Box 6725
Costa Mesa, Calif. 92626
714-662-5600

I/O devices

Lynk Corp. has introduced the Megalynk, a 20-in. color display workstation with IBM 3197C emulation capabilities.

The device emulates the IBM 3197C and 3197D terminals and offers 80- and 132-column displays in color, according to the company.

A programmable printer port and a key-ahead function are also provided. An optional Personality Pak is available for split-screen, cutting and pasting capabilities, the vendor said.

The midrange workstation sells for $4,495.

Lynk
101 Queens Drive
King of Prussia, Pa. 19406
215-265-3550

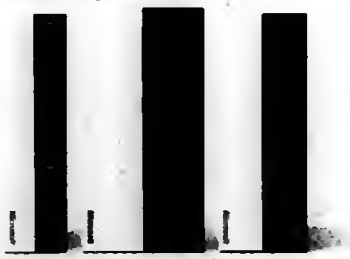
How to decide on a

More than likely, you've seen a few spreadsheets in your day. The problem is, on any given day you might find several in use within your very domain. One for Mac.® One for MS-DOS.® Even one for MS® OS/2.

But what happens when members of the same corporation need to share ideas and information? The only thing they end up sharing is frustration.

Well it doesn't have to be that way. Now, with Microsoft® Excel you can employ one spreadsheet solution throughout the entire corporation. Because the Microsoft Excel family shares the same file structure, macro language, and most important, interface.

The glue behind all of this is GUI. As you know, the graphical user interface is quickly becoming the industry standard. And that, in turn, means users find Microsoft Excel easy to learn. And therefore, easy to use. They'll be up and running before you know it, sharing files and even macros. All of which means lower training and support costs for the company—as well as a little



Customers inside the 50 United States, call (800) 541-1261, Dept. K17. In Canada, call (416) 673-7638. Outside the U.S. and Canada, call (206) 882-8661. ©Copyright 1989 Microsoft Corporation. All rights reserved. Microsoft, the Microsoft logo, MS-DOS and

And f

Macintosh

DOS-Windows 286/386

spreadsheet once.

peace and quiet for you.

Beyond the fact that Microsoft Excel is a strategic solution for your company, the plain fact is, users love it. And they're not the only ones. Consider this: Microsoft Excel for Windows won *PC Week*'s Poll of Corporate Satisfaction. And it was voted *InfoWorld*'s MS-DOS Product of the year.

Not to be outdone, Microsoft Excel for Macintosh® received *InfoWorld*'s Mac Product of the Year. And was ranked number one in the *Software Digest* Spreadsheet Review.

Even better, the move to a graphical spreadsheet couldn't be easier. Lotus® 1-2-3® users can simply upgrade to Microsoft Excel for Windows or OS/2, while Mac users can enhance their spreadsheet experience by upgrading to version 2.2.

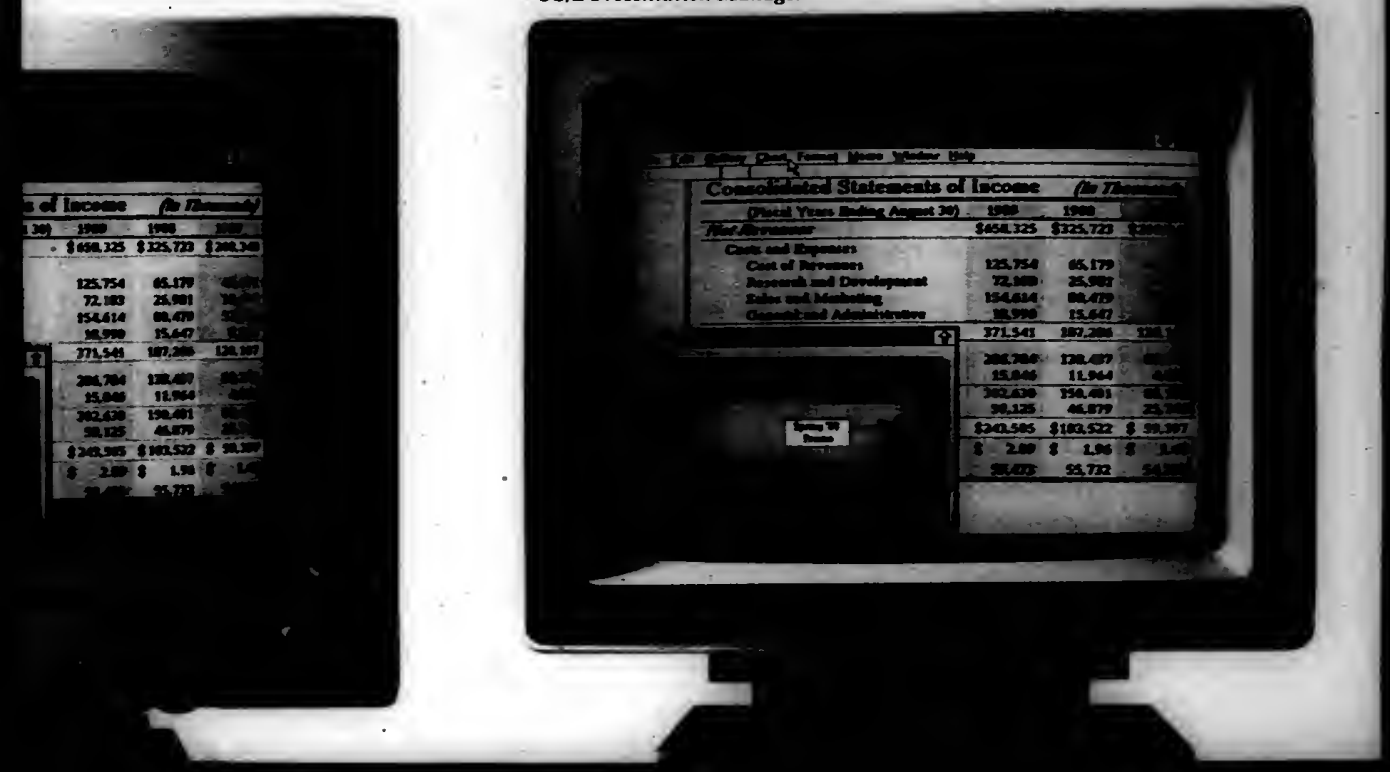
To see how other corporations are using Microsoft Excel across multiple platforms, call for a free copy of our White Paper at (800) 541-1261, Dept. K17. And watch something positive spread all over the corporation. Your reputation.

Microsoft®
Making it all make sense®

MS OS/2 are registered trademarks and *Making it all make sense* is a trademark of Microsoft Corporation. Lotus and 1-2-3 are registered trademarks of Lotus Development Corporation. Macintosh and Mac are registered trademarks of Apple Computer, Inc.

or all.

OS/2-Presentation Manager



Proof that a four-session terminal is more productive than a two-session terminal.

Introducing the IDEA 177. A System 3X or AS/400 terminal that can actually double your productivity by making it possible to perform as many as four tasks at once.

For example, a warehouse supervisor receives an order. With the IDEA 177's two host-addressable printer sessions and two simultaneous display sessions, he or she can check inventory, evaluate a customer's credit, scan the product's serial number with a bar code reader and print shipping documentation all at the same time. On the other hand, an insurance agent might concurrently enter a claim, review prior claims, determine a customer's payment history, then print a letter to the local agent.

The possibilities are limitless. And so are the ways in which you can configure the IDEA 177. It features full 5219 emulation, and its two printer ports make it possible for you to connect to virtually any PC printer. You can use the serial port to take in data from magnetic stripe or bar code readers, and simultaneously print through the parallel port.

The IDEA 177 presents information in 80 or 132 columns, on your choice of green, amber or color screens.

For more information on the four-session IDEA 177, call 1-800-257-5027. It's one terminal that can really nourish your appetite for greater productivity.

IDEA

The intelligence to do things better.

IDEA Courier IDEAssociates IDEA Servcom

IDEAssociates, Inc., 29 Dunham Road, Billerica, MA 01821, (508) 663-6878, FAX (508) 663-6851; European Headquarters (France), 33-14-035-5858; Asia/Pacific (Hong Kong), 852-5-420172; United Kingdom, 44-1-390-5945. AS/400 is a trademark of International Business Machines Corporation. IDEAssociates and IDEA are registered with the U.S. Patent and Trademark Office by IDEAssociates, Inc. Courier and Servcom are registered trademarks of IDEA Courier, Inc.

MICRO BITS

Peter Bartolik

Digging for the truth

You may have seen the ads, but you shouldn't believe them.

Intel has been spending money hand over fist to run a two-page campaign in trade publications and daily newspapers. The first page features the number "286" with a red X sprayed over it. The second features a big "386" with the letters SX underneath. And the message is, it "doesn't make sense" to buy a personal computer using the 80286 processor; instead, you'll get more at the same price if you opt for a system using the hybrid 386SX chip.

Both Intel and Microsoft Chairman Bill Gates have been singing the same insulting song for the past few weeks: You're a fool if you buy a 286-based system.

Continued on page 55

Inside

- Ashton-Tate clings to Multimate lifeline. Page 49.
- Citicorp users learn to Excel. Page 49.
- Manzana's two-headed drive is no floptical illusion. Page 52.

Peripheral wait hinders buses

Nonetheless, EISA-related rollouts expected to hit market this month

ANALYSIS

BY RICHARD PASTORE
CW STAFF

What use are the wider I/O paths of the 32-bit EISA and Micro Channel machines without peripherals that take advantage of them? About as useful as a newly widened four-lane highway to a person riding a scooter, say users and analysts.

A paucity of 32-bit local-area network cards, disk controllers and graphics boards is undermining the power of personal computers based on IBM's Micro Channel Architecture (MCA) and rival Extended Industry Standard Architecture (EISA), observers said.

However, industry experts expect this month to be a big one for peripheral debuts, particularly those that are EISA-related. A few networking devices have already rolled in on the coattails of last week's Compaq Computer Corp. EISA introduction.

Without 32-bit peripherals, users' investments are compromised. "You want to match processor power to peripheral power to get the most for your dollar," said Bruce Stephen, an analyst at Framingham, Mass.-based market research firm International Data Corp. "If the system is 32-bit, you're only tapping half its capabilities with 16-bit peripherals."

Users know they need more than just a high-speed processor. "It does me no good to be able to pump data through a CPU at whirlwind speeds and have it sit in a print buffer waiting to print," said Ronald Blystone, director of MIS at Harsco in Camp Hill, Pa.

Baxter Healthcare Corp. is planning to tie its more than 200 LANs to Intel Corp. 1486-based file servers — either MCA or EISA machines. However, a search during the last six months failed to turn up a 32-bit LAN adapter that would optimize the boxes' performance, said Brian Cobble, manager of competitive systems technology.

"We didn't find anything, so we've decided to wait and see what comes out for EISA and the Micro Channel world," Cobble said.

A similar wait-and-see attitude on the part of vendors is one reason why 32-bit peripherals have been slow to make it to market. Some vendors, fearful of siding with either EISA or MCA

Continued on page 56

Apple finds indirect route to business world

BY JAMES DALY
CW STAFF

CUPERTINO, Calif. — The terrible teens at Apple Computer, Inc. have begun with a hormonally charged drive to enter the corporate boardroom — and they have meant drastic action and new growth.

Apple's recent success in securing large contracts with the U.S. Air Force, Aetna Life & Casualty Co., Pacific Bell and other major computer users is indicative of a war being won by the Apple Integrated Systems division (AIS), which is making good on the 13-year-old company's long-standing promise to capture big business contracts that previously seemed beyond its grasp.

Heading up that mental and technical challenge is Vice-President of Customer Service and Information Technology Morris Taradalsky, whom Apple snatched from the bulwark of the corporate world — IBM. With 18 years at the industry giant — including three years as general manager of IBM's prestigious Santa Teresa, Calif., laboratories — Taradalsky serves as an evangelist with the challenge of promoting the view that the desktop is the window into the historical information systems glass house.

Apple's Taradalsky *takes on the challenge of promoting the desktop*

"For years, Apple was viewed as a company that simply did not understand the corporate world," Taradalsky said in a recent interview. "The perception of Apple users is that they have this stovepipe mentality, doing their own thing and building their own systems."

With the herd mentality seen as a key ingredient in most corporations, some managers were not comfortable with the idea of a loosey-goosey Apple user putting cracks in the foundation. It was up to Taradalsky to prove that the two ideals are not mutually exclusive.

"When we say we focus on the individual, we're not describing an independent entity. We're describing a way of computing to get your job done faster," he said.

Taradalsky also discovered

Continued on page 56

Micro Focus brings 370 Assembler to the PC!

The Micro Focus 370 Assembler is a tool which helps maximize the productivity of both the mainframe Assembler programmer as well as the COBOL programmer whose application calls Assembler subroutines.

Micro Focus 370 Assembler allows PC development and maintenance of host based Assembler and mixed COBOL/370 Assembler applications when used with Micro Focus COBOL/2 Workbench. The full featured Assembler programming environment includes:

- ❑ Macro Processor
- ❑ Assembler
- ❑ Linkage Editor
- ❑ Run Time Facility
- ❑ Interactive Debugging Facility

MICRO FOCUS®
A Better Way of Programming™

- ☞ Rapid Macro processing and Assemblies
- ☞ Reduced Host dependency and turnaround
- ☞ Reduced development time
- ☞ Interactive 370 Assembler debugging
- ☞ Support for the full IBM 370 and 370 XA instruction set
- ☞ Reduced mainframe resource utilization

For more information about the Micro Focus 370 Assembler or about other Micro Focus products call **1-800-872-6265** or **415-856-4161.**

WE WON'T MAKE YOU FORK IT OVER.

With a Meridian SL-1 PBX from Northern Telecom you can feel secure. The record shows that only the Meridian SL-1 has consistently provided a safe, sure way to grow.

Since it was introduced, no one has ever had to trade it to upgrade it—a record no other PBX can match. But then the Meridian SL-1 is different from other PBXs. Its architecture is modular, so you can add major new capabilities while preserving up to 100% of your investment. So call 1-800-328-8800.

Because we designed the Meridian SL-1 so you'll never have to face a forklift again.

nt northern telecom

NORTHERN TELECOM

When Texas Instruments decided to offer their latest portable solutions, they focused on two things users really wanted in 286-class laptop computers.

Light.

TI introduces the TravelMate™ L
Full-function AT-compatibility, featuring two of th

Model 12: All the power — half the weight.

Weighing a remarkable 6.7 lbs. — including battery and 20 MB hard disk drive — TI's TravelMate LT286 Model 12 delivers all the processing power of a desktop PC in a laptop. It's the perfect choice for professionals who need to work on-the-go.

Getting started couldn't be easier. That's because the Model 12 has MS-DOS 3.3® and LAPLINK™ in ROM. It also comes with a preformatted disk drive, making it ready to use right out of the box.

With the Model 12, you don't sacrifice performance for small size and weight. Business software runs fast, thanks to a 12 MHz 80286 microprocessor. There's plenty of storage for all kinds of software applications — the internal hard disk drive comes standard. Plus, you get 1 MB of RAM, expandable to 4 MB.

Not only does the Model 12 perform like a desktop PC, it has the same touch. The AT-style keyboard provides full-size, full-travel keys that give your fingers plenty of room.

Other features include an easy-to-read, enhanced Supertwist backlit LCD screen. A removable 3.5" high-density diskette drive provides additional flexibility and convenience — snap it on for loading software or remove it and travel light. And, sending critical work to your office takes only a phone call with an internal modem.

The TravelMate LT286 Model 12: the laptop that doesn't compromise performance for size.

The removable 3.5" high-density diskette drive and internal modem are optional

Bright.

LT286 Series of laptop computers.
The industry's lightest, brightest portable solutions.

Models 25 and 45: Dazzling display for windowing and graphics.

If you want portability and an exceptional display for graphics, you'll appreciate the bright side of this solution. TravelMate LT286 Models 25 and 45 feature a brilliant black-on-white VGA display that rivals that of most desktop PCs.

This makes text easy on the eyes and provides crisp, well-defined graphic images for applications that use MS® Windows, like PageMaker® and Excel.™ The VGA screen is perfect for presentations to clients and prospects, plus your own personal use.

Not only do you get a superb display, you get superb performance as well. Like standard AT-compatible desktop PCs, Models 25 and 45 operate with a 12 MHz 80286 microprocessor for quick and powerful processing. You also get a 20 MB or 40 MB internal hard disk drive; an internal 3.5" diskette drive; 640K of RAM, expandable to 3.64 MB; an AT-style keyboard with full-size, full-travel keys; and an internal battery.

In addition, an intelligent power management system turns off the screen and fixed disk drive during periods of inactivity to extend battery life, allowing you to use the laptop longer.

Considering all these features and the performance and versatility they deliver, why would you ever need a desktop PC?

For computing on-the-desk or on-the-go, it's TravelMate LT286 Models 25 and 45: the 286-class laptops that combine might with bright.

Two decades of portable solutions add up to lighter, brighter solutions.

Twenty years ago, TI introduced the world's first portable data terminals. Today, with nearly a million units sold, we've established ourselves as a market leader by offering products that increased in functionality and decreased in size.

This unparalleled experience has enabled us to provide you with the TravelMate LT286 Series – laptop computers that are powerful, innovative and durable. Qualities you have come to know and expect from TI. The choice for lighter, brighter portable solutions.

For more information, call TI today. **1-800-527-3500.**

TEXAS INSTRUMENTS

44383 ©1989 TI

TravelMate and Silent 700 are trademarks of Texas Instruments. AT is a registered trademark of International Business Machines Corporation. LAPLINK is a trademark of Traveling Software Inc. Excel is a trademark and MS and MS-DOS 3.3 are registered trademarks of Microsoft Corporation. PageMaker is a registered trademark of Aldus Corporation.

Bank group excels with Windows

Hemmed in by 1-2-3, some users switch to icon-based spreadsheet

ON SITE

BY PATRICIA KEEFE
CW STAFF

SAN FRANCISCO — Two years ago, a handful of financial analysts at Citicorp's Private Banking Group began hitting the upper limits of Release 2.0 of Lotus Development Corp.'s 1-2-3 spreadsheet. Release 3.0, never mind 2.2, was nowhere in sight, yet these power users needed to turbo-charge their desktops — and fast.

The solution, it turned out, was to switch to Microsoft Corp.'s Windows Excel. Not only was the icon-based spreadsheet easier to use, but it took advantage of Windows and it has helped to cut down the time required to do reports, said Cathy Vincent, a staff financial analyst.

Vincent concedes she has not seen 1-2-3 Release 3.0, which Lotus finally rolled out several months ago. But in any case, hers is a Windows environment now, and Lotus still does not offer a Windows-based version of its popular spreadsheet.

"We've made our decision. After working with [Excel] for two years, it would be too hard to go back [to Lotus]," she said, underscoring recent comments by some Windows users that Lotus is missing opportunities by not operating under Windows.

So, Vincent's group has relegated Lotus to the "not really high-power users," who tend to be marketing people with applications calling for simple spreadsheets. This actually constitutes most of Private Banking Group's 50 employees. "We'll be looking at 2.2," she said.

Only about three or four on the staff — financial analysts — have felt the need to move to Windows Excel. These power users write a lot of financial reports that Vincent said call for "more sophisticated capabilities" than 1-2-3 Release 2.0 could provide.

For example, Vincent said she takes great advantage of Windows' Dynamic Data Exchange to link forms and various spreadsheets together — both her own and to other Excel users' spreadsheets.

She does some linking to Microsoft's Word for DOS word processor, but indicated it has problems working with Windows. "You're not pulling down the same menus and seeing the same wording," Vincent explained. As such, although she has seen only a beta-test version of Word for Windows, which was introduced two weeks ago, she will probably migrate: "We're bugging them for it."

Touchless updates

When Word for Windows is linked to Windows Excel, a change in price made in one package can be automatically updated on the spreadsheet without touching the keyboard.

Vincent sees a lot of potential for future integration between Word and Excel under Windows. For example, the new Word for Windows features both the ability to import and integrate a variety of data, images and text as well as hot links to source data from other Windows applications. The need for such integration is driving her group to further exploration of the idea of purchasing packages from the same developer, she said.

Vincent has also used Windows Excel to automate a quarterly budget report and a monthly financial analysis. "It enables you to create report shells so that you can kick out reports on a monthly basis once you feed in certain data," she said. The time it used to take under Lotus to put these reports together has been cut in half, Vincent said.

Some of the work Vincent does can be done under Lotus, but she finds it much easier to do it under Excel. Yet at the time, Vincent did not switch to Windows Excel to use Windows. "We bought it [initially] because of the hard-copy presentation," she said, citing the font selection and the way the package interfaced with laser printers.

Like anything else, Windows Excel does have drawbacks. Vincent runs Windows Excel on a Compaq Computer Corp. 386/S with 4M bytes of extended memory, upgraded from expanded

Continued on page 56

Ashton-Tate: News of death was exaggerated

BY CHARLES VON SIMSON
CW STAFF

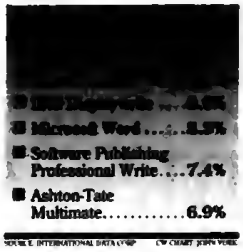
SAN JOSE, Calif. — Ashton-Tate Corp. recently provided some signs of a pulse, proving to many analysts that the company is just sleeping, not dead, as the industry waits for Dbase IV Version 1.1.

The company announced Multimate Version 4.0, as well as a utilities and business graphics package. Ashton-Tate has high hopes that its newest word processing package can jump Multimate from its current sixth-place position — fifth in some market rankings — into third behind leading packages from Microsoft and Wordperfect.

"[Word processing] is a fragmented market, and that makes it easier to move up," said David Bayer, software analyst at Montgomery Securities in San Francisco. "But Windows is a major factor, and the announcement of Microsoft Word for Windows doesn't help [Ashton-Tate's] position."

Aiming higher

Ashton-Tate is waiting for a new release of Multimate to move it up in the ranks of word processing packages



Microsoft announced that the Windows version of Word would be available in December. That does not help Ashton-Tate's efforts, but most observers agree that Multimate enjoys a large installed base, and any large-scale move to Windows will take several product generations.

In addition, the new version will include several new features. Electronic mail and grammar-checking functions, both acquired from third parties and integrated into the package, are among the most significant.

Even if Ashton-Tate does make strides with Multimate, however, the product accounts for only about 15% of its total revenue and is not enough to buoy the company if Dbase IV Version 1.1 does not float. "The new products are all solid efforts but can only do a limited amount toward getting Tate back on track," Bayer said.

The company also announced Applause II, a business graphics package, and Control Room, a PC utilities package. Most notable about the announcements was the $95 introductory price of the Applause product, which ultimately will carry a manufacturer's list price of $495.

"There is no grand scheme to re-price graphics," said Richard Dym, marketing manager for Applause. "The overall penetration of graphics on stand-alone computers is less than 10%; we wanted to remove price from the decision-making process." The package will go to its suggested list price on Feb. 1, 1990.

Everex blasts off 21-MIPS RISC Unix workstation

BY JAMES DALY
CW STAFF

FREMONT, Calif. — Everex Systems, Inc. let fly a blast of computational power recently with the rollout of a reduced instruction set computing (RISC) Unix workstation that reportedly can process up to 21 million instructions per second (MIPS).

The Step 8825 also casts another ballot for Motorola, Inc.'s 25-MHz 88000 RISC microprocessor, which powers the Everex machine.

The RISC architecture optimizes speed by simplifying the computer's internal communications.

Like its predecessor, the 17-MIPS Step 8820, the Step 8825 uses a dual-processor, dual-operating-system setup that employs an Intel Corp. 80X86 as a coprocessor to service 88000 I/O requests and run MS-DOS applications.

Memory to 20M bytes

The new model is available in memory configurations of 4M to 20M bytes.

Everex officials said the Step 8825 complies with the 88open Consortium's Binary Compatibility Standard (BCS) for the 88000, ensuring compatibility with all BCS-compliant Unix software developed for the 88000.

The machine is available for immediate delivery, with prices starting at $14,995.

DB2 ON YOUR PC

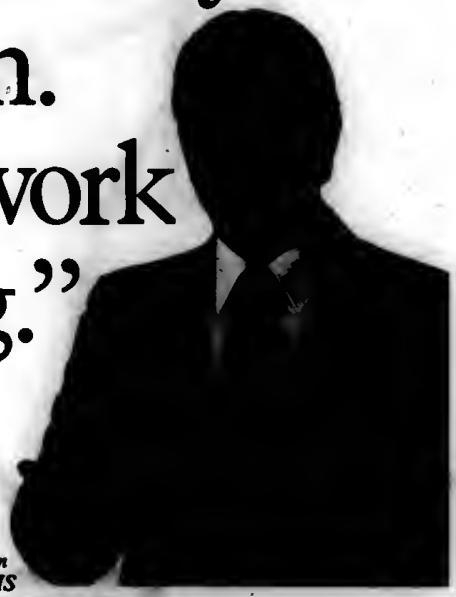
xdb

Call (301) 779-6030

XDB Syste
309 Ba timore Ave
College Park MD 0
XX 301 1

Chuck Daly
Head Coach
NBA Champions
Detroit Pistons

"In This League, The True Superstar Not Only Gives You An Outstanding Individual Performance, But Also Elevates The Play Of The Team. Because Teamwork Is Everything."



Bill Thompson
Director of MIS
The Sherwin-Williams Company
Paint Stores Group

Introducing The NCR PC486/MC.

Every successful team needs a lead player. Whether the arena is basketball or business.

The lead player in today's PC market is the new NCR PC486/MC, the personal computer designed for the power user.

The NCR PC486/MC sets a new standard in speed, performance, and productivity—combining a 25MHz Intel486™ microprocessor, Micro Channel™ Architecture, 128KB of high-speed cache memory (twice what you find on competitive models), a Small Computer System Interface (SCSI) controller, and SuperVGA graphics are standard.

This is a true multi-tasking personal computer. Ideal for large spreadsheets, extensive database management, financial modeling, artificial intelligence, networking, and more.

Importantly—you also have the choice of MS DOS®, OS/2™, and UNIX® operating systems.

Like all NCR personal computers, the PC486/MC is a team player, networking information, applications, and resources quickly and efficiently. So people can make better decisions and work together more productively as a team.

Supporting the superstar PC486/MC are the entry-level PC286 desktop and the ever-powerful PC386. Between them in our lineup are the PC386sx and the PC386sx/MC, two Intel386™SX-based personal computers that deliver significantly improved price/performance capabilities over Intel286™-based PCs.

NCR teamwork goes beyond hardware and software, providing dedicated service and support for a solutions approach always open to individual needs. Because that's the name of the game.

For a free literature packet on this new team of personal computers and the location of the Authorized NCR Reseller or sales representative nearest you, call **1 800 544-3333**. Or write to us at P.O. Box 2989, Norcross, Georgia 30091.

NCR PERSONAL COMPUTERS
Because Teamwork Is Everything

NCR

Creating value

NCR is the name and mark of NCR Corporation. 286, 386, and 486 are trademarks of Intel Corporation. MS and MS DOS are registered trademarks of Microsoft Corporation. Micro Channel and OS/2 are trademarks of IBM Corporation. UNIX is a registered trademark of AT&T Bell Laboratories. © 1989 NCR Corporation

'Floptical' puts its heads together

BY RICHARD PASTORE
CW STAFF

A floppy disk drive that crams 20M bytes of data onto a 3½-in. disk may substantiate the adage that two heads are better than one. Two drive heads, one magnetic and one optical, and specially prepared disks make possible the 20M-byte capacity of the "floptical" drives announced recently by Santa Barbara, Calif.-based Manzana Microsystems, Inc.

The optical head reads servo information, or data positioning cues, optically embossed on the disk by the manufacturer. Because they are optically recorded, the cues are highly precise and take up very little disk space. These factors in turn allow the magnetic head to record data more densely on a larger area of disk surface.

The Manzana/VHD drive, which can be connected to IBM Personal Computers, XTs, ATs and Intel Corp. 80386-based compatibles, operates at twice the access rate of 1.44M-byte 3½-in. floppy drives, the company said. However, it cannot keep pace with an average hard disk drive, which can seek data at five times the speed.

The most obvious potential users are those needing to back up 20M-byte hard disks, said Robert Katzive, an analyst at research firm Disk/Trend, Inc. in Los Altos, Calif. "They wouldn't have to fool around with the slower tape drives, buy weird cartridges or learn a new set of software," he said.

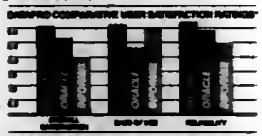
Other users who could benefit include those needing to store files measured in multiple megabytes — graphical files in particular, noted David Gluck, Manzana president.

Gluck said pricing for the drive has not been determined, but he said an internal version will cost less than $1,000, and the external model will be priced higher than the internal. The optically embossed disks, available from the company, carry an OEM price of $20 each. Manzana licensed the disks and drives for resale from developer Insite Peripherals in San Jose, Calif.

The Manzana/VHD drive will be demonstrated at the Comdex/Fall '89 trade show this week and is expected to ship in the first quarter of next year.

Finally, A 4GL That Can Thrive In Any Corporate Culture.

Regardless of the corporate environment, regardless of the application, regardless of the hardware you're working on, there's one 4GL that always delivers fruitful results.



PROGRESS, truly adaptable 4GL/RDBMS software that organizations like The Dannon Company, Sherwin-Williams, and Marriott Corporation rely on to perform miracles every day.

A 4GL that's used in fields as diverse as manufacturing, health care, and bond trading. That topped the Datapro ratings of 4GLs two years running (see chart). And one that lets you easily produce reports, perform queries, and paint screens.

What's more, PROGRESS comes with automatic crash recovery and ANSI-standard SQL. And because you write everything in our 4GL, you're guaranteed portability across VAX/VMS, MS-DOS, UNIX, CTOS/BTOS, and networks.

So call to test-drive a complete evaluation copy of PROGRESS, and ask about our Demonstration Video.

It's one 4GL that will suit everyone's taste.

That's PROGRESS®
1-800-FAST-4GL
In Massachusetts, (617) 275-4500

© 1989, Progress Software Corporation, 5 Oak Park, Bedford, MA 01730. PROGRESS is a registered trademark of Progress Software Corporation.
*Compiled from the most recent Datapro 70 Reports on Software. VAX/VMS, MS-DOS, UNIX, and CTOS/BTOS are trademarks of their respective manufacturers.

COME SEE US AT BOOTH #3220 AT COMDEX FALL

Maintenance and more from Zenith

BY ELLIS BOOKER
CW STAFF

GLENVIEW, Ill. — The U.S. government's largest supplier of personal computers, Zenith Data Systems (ZDS), has nabbed a seven-year, $534 million contract to supply several U.S. Defense Department agencies with peripherals, software, training and maintenance services.

The Standard Desktop Computer Companion Contract, awarded last week by the Navy's Automatic Data Processing Selection Office, covers the estimated 500,000 desktop and laptop PCs that ZDS has sold to the government since 1983. The hardware and software support extends over five years, after which the government can continue to receive maintenance, training and support services from ZDS for two years.

ZDS parent Zenith Electronics Corp. last month agreed to sell its computer business, including ZDS, to Groupe Bull of France, which is largely owned by the French government.

While foreign ownership of ZDS makes the "circumstances of the award a little unusual," according to a Navy spokesman, he added that the U.S. government does not believe this will have a material impact. He noted that ZDS has maintained it will continue to be a U.S. company incorporated in Delaware with U.S. manufacturing.

Laptop competition heats up

BY SALLY CUSACK
CW STAFF

The battle for heavyweight market share in the lightweight laptop arena has escalated in recent weeks with the introduction of several battery-powered portable personal computers, each weighing in at under 15 pounds.

Tandon Corp. unveiled the company's first two laptop machines. Each incorporates high-definition supertwist LCDs and weighs 14½ pounds.

The LT/386, based on Intel Corp.'s 80386 chip, has a 386SX microprocessor operating at either 8 MHz or 16 MHz and uses the low-powered CMOS variant of the Intel chip, the company said.

It includes IBM Video Graphics Array (VGA) capabilities, a 40M-byte hard disk and a 3½-in., 1.44M-byte floppy drive and is priced at $3,950. Deliveries are scheduled for December.

The firm's LT/286 machine reportedly uses the CMOS version of the Intel 80286 chip, running at either 6 MHz or 12 MHz. Currently available, it is equipped with a 20M-byte hard disk for $3,160.

Texas Instruments, Inc.'s Travelmate LT286 series offers a choice of three models. The Model 12 weighs 6.7 pounds, measures 8.2 by 11.7 by 3.2 in. and incorporates 1M byte of random-access memory, expandable to 4M bytes, and a 20M-byte hard disk drive. It costs $4,199.

TI's *Travelmate LT286 series has three models ranging in weight from 6.7 lbs. to 14 lbs.*

The 80L286-based Models 25 and 45 tip the scales at 14 pounds each, offering 640 by 480 dot/in. VGA capability. The Model 25 features a 20M-byte hard disk drive; the Model 45 has a 40M-byte hard disk. Both systems offer 640K bytes of RAM. They cost $4,999 and $5,599, respectively.

Rounding out the laptop parade is Toshiba America Information Systems, Inc., which introduced a 5.9-pound portable unit, the T1000SE. The 9.54-MHz system is based on an Intel 80C86 chip and is slated for delivery in January. The suggested price is $1,699.

In addition, Toshiba introduced a 14.9-pound, 16-MHz Intel 80386SX-based portable device. The T3100SX is scheduled to ship next month and includes 1M byte of RAM, expandable to 7M bytes in 2M-byte memory increments, or a total of 13M bytes using 4M-byte memory modules. The unit also features a 40M-byte hard disk and carries a price tag of $5,999.

MICRO NOTES

Toshiba controller chip ups speed, reduction

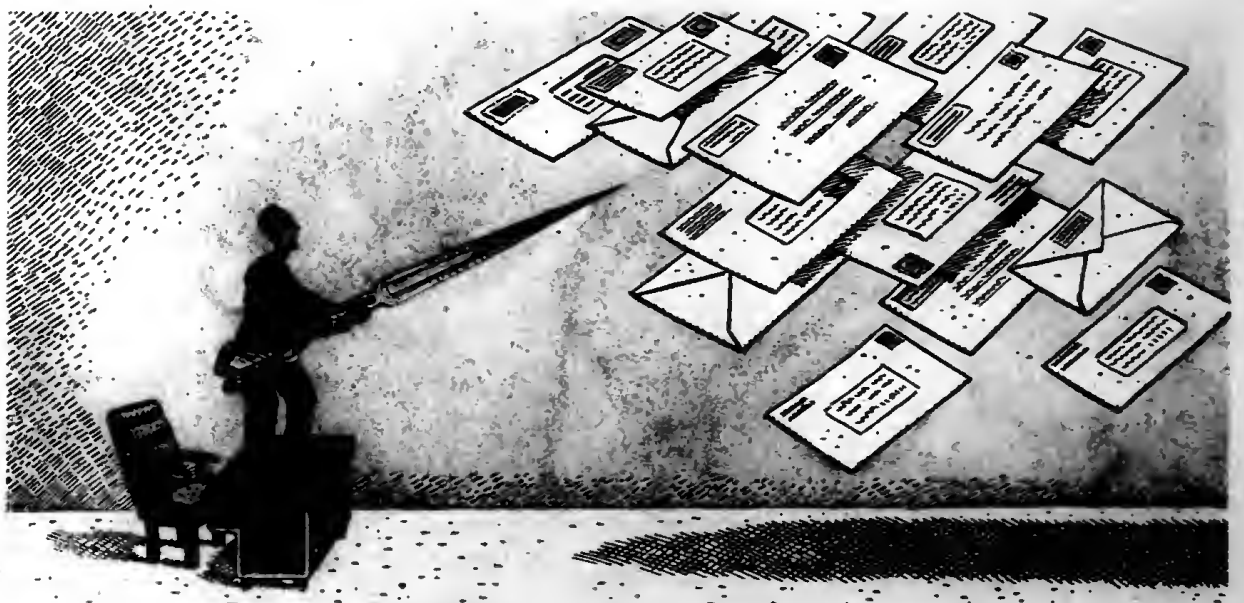
Toshiba Corp. has started marketing a new controller chip, the TMP68301, which reportedly will speed up laser printers, copiers and graphics terminals and allow those devices to be reduced in size. Based on Motorola, Inc.'s MC68000 processor, the chip could allow board builders to reduce the size of their printed circuit boards to about one-tenth of their current size.

Redgate Communications Corp. is offering a compact disc/read-only memory (CD-ROM) version of its *The Macintosh Product Registry.*

Executive Technologies, Inc. (ETI), developers of CD-ROM retrieval software, said that the U.S. Government Printing Office has purchased 2,300 copies of ETI's Search-Express package. It will be used to produce a CD-ROM disc for the Environmental Protection Agency (EPA), which will be available in 1,400 Federal Depository libraries nationwide. The EPA will use another 300 copies, while 600 copies will be offered for sale to the general public.

Oracle Corp. has turned its attention to computer-integrated manufacturing (CIM). The company's Oracle relational database management system will serve as a platform for integrating applications, databases and information in an enterprisewide CIM strategy. Other components include its integrated families of manufacturing and financial applications and a team of CIM partners, described as developers of Oracle-based engineering or shop-floor applications.

Millenium Software has announced co-marketing agreements with **Oracle** under which Millenium's Hyperz Fusion application development tool will provide Apple Computer, Inc. Macintosh users with direct access to Oracle databases through Oracle's Hypercard interface.



"Our competition promises immediate response. With this system, we've learned not to promise anything."

Anyone can develop a Macintosh-to-IBM mainframe link. On the surface.

It's not particularly difficult to physically connect a Macintosh to an IBM mainframe. The hard part is coming up with a solution that takes the whole process to a much deeper level.

No one knows this better than Avatar.

The fact is, with over seven years of 3270 connectivity experience and a dedication to Macintosh integration ever since there was a Macintosh, MacMainFrame can offer you advantages nothing else can.

Like software that works exactly the same on every single Macintosh model, from the Mac512Ke to the MacIIcx.

Software designed to cut training costs now and built with staying power for the future when your system needs become more complex. Both of which can really help you keep things under control.

And where others settle for mere physical connectivity, Avatar gives you performance much deeper than that.

Like true Mac-like DFT support that lets you run as many as five mainframe sessions at once, and that *PC Week* said, "stands in a class by itself."

Like the ability to customize applications so users work with mainframe information precisely the way *you* want them to. There's even a special programmer's toolkit that comes with Avatar's API, Hypercard API, and MacWorkstation TLPM module. And naturally, we support all Apple standards and conventions.

Even more importantly, you can expect the responsive service, support and applications expertise that it takes to make a connectivity solution really work.

We have a free brochure on Mac-to-mainframe connectivity that will answer many of your questions. To receive yours, call us at 1-800-289-2526. Or write: Avatar Corporation, 65 South Street, Hopkinton, Massachusetts 01748.

Avatar

IBM is a trademark of International Business Machines Corporation. Macintosh is a registered trademark of Apple Computer, Inc.

Bartolik

FROM PAGE 47

You have to admit, the come-on is sttractive. They're saying you can buy s 386SX for the same price as a 286 system and with it you'll be sble to run "all the new 386 software." What kind of choice is that?

Well, it's s fool and his money that are easily parted. Sure, you can buy s 386SX for the price of a 286, but not from the same vendor. And running the new "386 software" is an easy boast to make because there is precious little of it out there.

Scan the direct mail listings and you'll be able to find s full-function 386-based system, skipping the limited-function SX version, for less than you can buy s 286-based system from Compaq or IBM. So what's new there? If you wait a couple of months, you'll probably be able to buy a 486-based system for s similar savings. But if you compare any one vendor's offerings, you'll find a $500 to $1,000 premium is the price tag for listening to Gates and Intel.

In point of fact, the older generation devices, even some souped-up PCs using even earlier-generation chips, may be more than enough to run the software that is currently available today. Most people will be able to tune older technology devices with the use of faster peripherals and added memory. A select few will indeed need the latest and the greatest.

So, what's behind this big campaign to cut off the 286? In this corner, the explanation is that the two micro stalwarts quite simply are falling back on s trusty business principle: If you can't convince the public with technology, scare 'em.

> IGNORE the ads. Make your decisions based upon what you determine to be your needs and preferences.

There are good business reasons for this. Intel is not the sole-source commercial supplier of 286 chips, but it is for the newer microprocessors. Microsoft hasn't able to convince the world that OS/2 is for you and, despite some bet-covering in the Windows arena, OS/2 is where the firm's fortunes lie.

But what is good for them is not necessarily good for you. You may have many people and functions that simply do not require a more powerful PC or have no need for software that is still basically an empty promise. A faster modem, faster disk drive and improved memory can do wonders for older generation systems running the bulk of software available today.

If you have signed on to OS/2, or have people with huge spreadsheets and databases, it may in fact be time to make the switch.

What is so aggravating, however, is that two prominent and heretofore respected companies are attempting to bamboozle their customers to make faulty strategies pay off. They are engaged in marketing tactics that are misleading at best and, in the case of the Intel advertisements, about as close to deceptive practices as you can get without sttracting the attention of the U.S. Justice Department.

So, ignore the ads. Make your decisions based upon what you determine to be your needs and preferences. And when Microsoft and Intel salesmen come calling, tell them, "Show me. Don't tell me."

Bartolik is *Computerworld's* news editor.

Nantucket attempts to reach SQL from Dbase

BY CHARLES VON SIMSON
CW STAFF

LOS ANGELES — Nantucket Corp. will attempt to stretch its investment in Ashton-Tate Corp. Dbase-dependent technology into the realm of other SQL relational database systems.

It is s stretch that experts say can be kludgy and may offer subtle problems that are not immediately apparent.

Nantucket plans to demonstrate the first of its Database Driver series of products st Comdex/Fall '89 this week. A driver for Borland International's Paradox files will be the first one introduced, followed by SQL drivers for Microsoft Corp.'s SQL Server, Gupta Technologies, Inc.'s SQL Base and Novell, Inc.'s SQL. Nantucket hopes these capabilities will encourage third-party and internal corporate Clipper developers to use the product for developing non-Dbase products, because they will be able to stay within Nantucket's Clipper syntax.

However, many SQL developers say procedural interfaces to SQL databases are often cumbersome. Procedural interfaces, such as the Clipper drivers, access one record at s time, while standard SQL works at the set level, accessing several records simultaneously.

"The translation between the two defeats the SQL optimization," said Fabian Pascal, an independent SQL specialist from Washington, D.C. "Companies like Nantucket with a Dbase investment are simply trying to kill two birds with one stone, but it is wishful thinking that by doing this they will be in the relational database area."

> IT IS A stretch that experts say can be kludgy.

Borland sources said that while they support Nantucket's efforts to build drivers between the two environments, the Clipper solution is a compromise.

"Our inventory and distribution problems won't go away until we get a system meant to solve them."

Peripheral

FROM PAGE 47

and unable to swallow the extra cost of developing products for both, have been holding off.

"They are waiting to see which side of the fence the buses and the users come down on," said Dan Ness, an analyst at market research firm Computer Intelligence in La Jolla, Calif.

At the same time, realizing that peripheral availability could help sway users, architecture champions such as Compaq and IBM have been trying to coax third-party developers to their sides. Whether the effort payed off may start to show up in the next month or so, particularly at Comdex/Fall '89.

"We'll see quite a few [peripheral rollouts] at Comdex; it's going to be a very big show for the bus architectures," Ness said.

A spokeswoman for Hewlett-Packard Co., which unveiled its first EISA PC last month, estimated that 15 different vendors will announce EISA peripherals this month.

At Compaq's EISA rollout, Proteon, Inc. and Codenoll Technology Corp. unveiled 32-bit EISA fiber-optic Token-Ring boards and an Ethernet interface card, respectively.

Maitland, Fla.-based Distributed Processing Technology unwrapped a small computer systems interface (SCSI) disk controller for EISA machines at the Compaq briefing. The device reportedly features a direct-memory access transfer rate of 33M byte/sec.

Also among the companies planning to show off peripherals is Mylex Corp. The Fremont, Calif.-based company will show up at Comdex with its new 32-bit graphics board, Ethernet adapter and SCSI caching controller for EISA PCs.

Apple

FROM PAGE 47

that the snappy user-friendly features that once distinguished Apple — windows, icons, pull-down menus — have been liberally borrowed by many firms and could no longer be leveraged as an exclusive selling point.

Recently, powerful tools have been added to the Apple line, including A/UX — Apple's version of the Unix operating system that was developed to better its chances when competing for government contracts.

Additionally, the company recently introduced the Macintosh IICI, a high-powered personal computer that competes squarely against low-end workstations.

Perhaps the most important of these tools was the suite of connectivity products introduced last June.

These tools sweeten the firm's corporate lure by enhancing the Appletalk network system's ability to communicate with Digital Equipment Corp. and IBM shops — the cornerstone environments of most Fortune 1,000 firms.

Analysts see the realignment as important for the company. "Apple will always primarily focus on the individual, but in order to become a $10 billion company they realize that they cannot shut their eyes on the corporation," said Benny Lorenzo, an analyst with the San Francisco-based Volpe, Covington & Welty investment banking firm.

Bank group

FROM PAGE 49

memory; and a 120M-byte hard drive, which replaced a 40M-byte drive. "I ran out of that real fast," she said.

"My biggest complaint about running Excel and anything else in Windows is that it eats up so much memory, particularly if I'm doing a lot of linking," Vincent said. She is hoping Windows 3.0, with its promise of improved memory management, will address this problem.

Despite Vincent's experiences with Excel, she admits that it has been hard to convince other Citicorp employees to use it. "They're all so into Lotus; they're just diehards." Still, she is finding herself giving more walk-throughs of Excel to interested staff members, most recently from the New York office.

Input Copy And Graphics Into Your Computer–Instantly–Without Using The Keyboard. Then Use Your Computer As A Full-Featured FAX To Transmit Documents Instantly.

All For Under $1,000!

PC MAGAZINE

Chinon's new scanners could change forever the way computers are used. With OCR software you can input text without retyping it. With a simple add-in card, turn your computer into a full-featured fax. And DS-2000 and 3000 will scan almost any type of graphic image, so they're perfect for desktop publishing.

DS-2000 and 3000 offer different resolution levels so there's a scanner that's right for your applications—and your budget. Both scanners come bundled with exciting software so it's easy for you to get started. Call TOLL-FREE for the dealer nearest you.

Toll-Free (800) 441-0222 • In CA (213) 533-0274 • Fax: (213) 533-1727

Chinon America, Inc.
660 Maple Avenue
Torrance, CA 90503

CHINON

DS-2000 And 3000:
The Affordable Scanners From Chinon

SEE US AT COMDEX BOOTH #W200/300

NEW PRODUCTS

Systems

Opus Systems, Inc. has announced a turnkey, AT&T Unix System V-based workstation that incorporates the recently introduced Motorola, Inc. 88000 25-MHz architecture.

The Personal Mainframe/8000-25 workstation performs at 21 million instructions per second and was designed for computer-aided design and manufacturing, software development and office automation applications, the company said. The system can also function as a file server.

Entry-level pricing for the Personal Mainframe/8000-25 is under $10,000.

Opus Systems
Building 400
20863 Stevens Creek
Cupertino, Calif. 95014
408-446-2110

Epson America, Inc. has introduced a laptop computer with a removable hard disk drive system.

According to the vendor, the Equity LT-286e comes equipped with a Datasafe disk drive that allows end users to easily remove the standard 20M- or 40M-byte hard disk drive for added security, upgrade or exchange purposes. The 13-pound computer can be powered by either an AC adapter or a removable nickel cadium battery and comes standard with a 3½-in., 1.44M-byte floppy disk drive and 8-MHz or 12-MHz switch-selectable clock speeds.

The Equity LT-286e is bundled with Epson MS-DOS Version 4.01, and it is priced at $4,599 for a 20M-byte hard disk configuration and $4,999 for a 40M-byte hard disk model.

Epson America
235330 Hawthorne Blvd.
Torrance, Calif. 90505
213-539-9140

Toshiba America Information Systems, Inc. has introduced an 80386SX-based portable computer.

The company reports that the T3200SX is a 17-pound portable unit with six internal expansion slots, 13M bytes of memory capacity and an IBM Video Graphics Array display system with a gas-plasma monitor.

A 3½-in., 1.44M-byte floppy drive and a 40M-byte hard drive are also included, according to the company.

The system has an announced list price of $6,299 with MS-DOS 4.01 standard. MS OS/2 Version 1.0 is optional and costs $325.

Toshiba
9740 Irvine Blvd.
Irvine, Calif. 92718
800-457-7777

Software utilities

Softshell Systems, Inc. has introduced an updated version of the Softbreeze user interface.

Version 3.0 is targeted at intermediate personal computer users who want to bypass DOS commands and organize their hard disks, the company said. The character-based program provides users with menus for task switching and for file-, disk- and memory-management functions. It requires less than 30K bytes of overhead random-access memory and carries a retail price of $99.

Softshell Systems
1163 Triton Drive
Foster City, Calif. 94404
800-322-7638

Personics Corp. has announced an enhanced release of Seemore, the company's windowing software system for use with Lotus Development Corp.'s 1-2-3 spreadsheets. Version 2 reportedly permits users of 1-2-3 Release 2, 2.01 and 2.2 to view rows and columns, create multiple windows and display live graphs. The product provides a choice of compressed formats capable of doubling, tripling or quadrupling the number of cells displayed on the screen, the company said.

The software runs on personal computers equipped with any standard graphics adapter and is priced at $99.95.

Personics
63 Great Road
Maynard, Mass. 01754
508-897-1575

Peter Norton Computing, Inc. has announced an expanded version of its Norton Commander DOS-manager software utility program.

Version 3.0 includes an expanded file viewer, which allows users to quickly view files in their proper formats without having to load the application with which they were created, the company said. Other features include an automated electronic mail function and file-transfer options.

Commander 3.0 requires an IBM Personal Computer, Personal System/2 or compatible machine and carries a suggested list price of $149.

Peter Norton Computing
9th Floor
100 Wilshire Blvd.
Santa Monica, Calif. 90401
213-319-2000

Development tools

Plano Computer Sales has released an enhanced version of the company's Data + Base database management system.

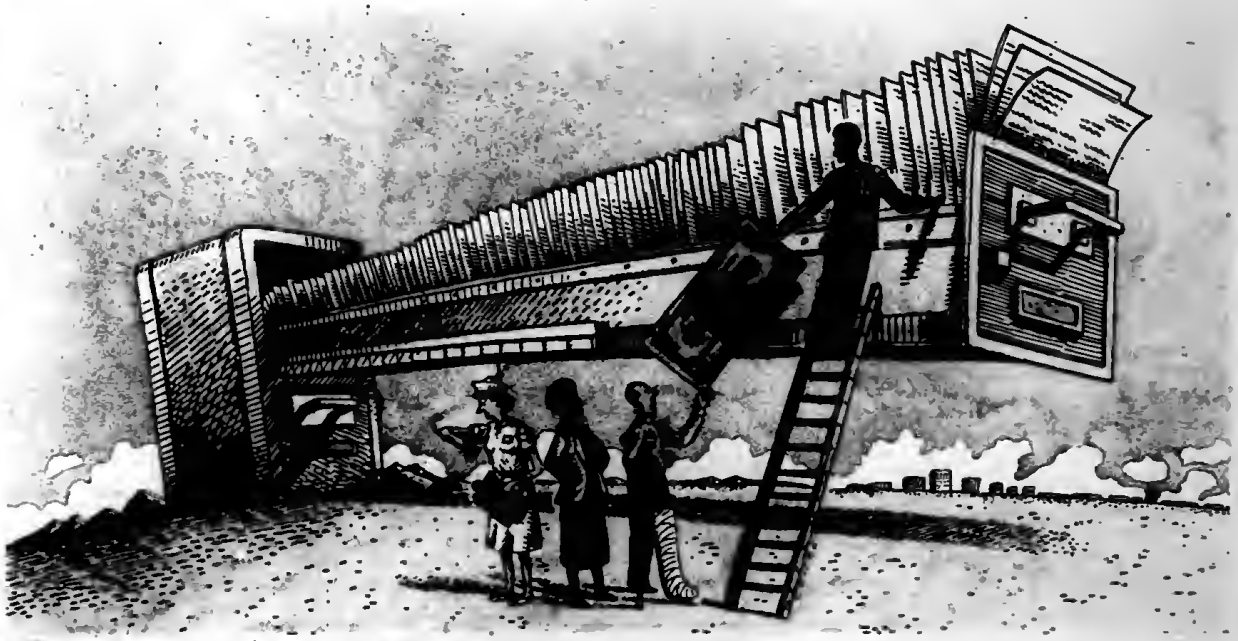
Version 3.97 has the capacity to accept over a billion records, the vendor said. The software program was designed to provide a menu-driven system for developing applications compatible with Ashton-Tate Corp.'s Dbase III and Dbase IV packages. Features include the ability to import, export and print memo fields, as well as a built-in application generator. The product is priced at $39.95.

Plano Computer
1001 Lockhart
Plano, Texas 75023
214-517-8662

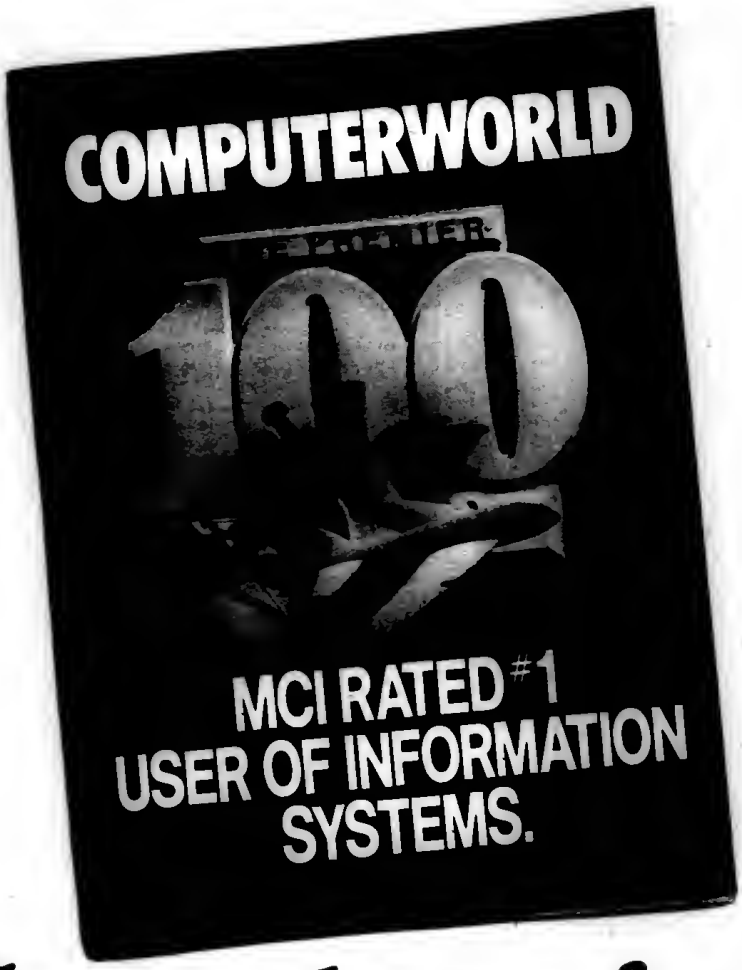
Clarion Software Corp. has announced another version of its database and application development system.

Version 2.0 of the Clarion Personal Developer has the ability to import and export files to

Continued on page 59



"This system just can't process claims fast enough. And that makes for a lot of dissatisfied customers."



Why good news for us is great news for you.

Recently, *Computerworld* named MCI® the most effective user of information systems in the country.

In their view, MCI did the best job managing information technology to achieve one of our key business objectives: To be the most flexible and responsive communications company.

A similar survey in *InformationWEEK* also rated us an industry leader.

Which is certainly good news for us.

But even better for you.

Because it's your assurance that as an MCI customer you'll have that same expertise working for you. Introducing new products with the features you want. Building you the most efficient network possible, with state-of-the-art advances. And giving you the tools to manage it yourself.

We believe that all of this indicates just how hard MCI is working to meet our business objectives. And how well we can help you meet yours.

For more information, contact your MCI Account Representative or call **1-800-888-0800.**

MCI®

Let us show you.

© MCI Communications Corporation, 1989

Continued from page 57

and from other database applications, the company said, including Ashton-Tate Corp.'a Dbase II and Dbase III, Lotus Development Corp.'a 1-2-3 and ASCII-delimited files.

The software was created for the nonprogrammer and carries a retail price tag of $199.

Clarion Software
150 E. Sample Road
Pompano Beach, Fla.
33064
305-785-4555

Data storage

Astro Systems, Inc. has announced a 3½-in. removable hard disk drive system designed to offer data storage and system security for desktop and portable personal computers.

According to the vendor, the product consists of three modules: the Travelpak, a hard drive storage device available in 40M-, 80M- and 100M-byte models; the Travelport universal drive housing unit; and appropriate adapter cards for IBM Personal Computers, Personal System/2s, Apple Computer, Inc. Macintosh machines and laptops from Toshiba America, Inc., Compaq Computer Corp. and NEC.

List pricing begins at $1,125.

Astro Systems
807 Aldo Ave., No. 106
Santa Clara, Calif. 95054
408-727-5599

Identica has introduced two ¼-in. tape drives with storage capacities of 60M to 150M bytes.

The drives use standard DC600 or DC600XT tape cartridges and reportedly back up and restore data at a minimum of 5M byte/min. under MS- or PC-DOS. The IDT-60 internal unit has a list price of $1,195, and the IDT-150 internal has a list price of $1,495.

According to the company, both units come with a three-year warranty and are available in external versions.

Identica
3350 Scott Blvd.
Building 7
Santa Clara, Calif. 95054
408-727-2600

Sigma Information Systems has announced a small computer systems interface expansion chassis with a removable canister.

Designated the SA-H204, the desktop enclosure was designed for applications that require a quick-disconnect, removable disk drive. The pluggable canister reportedly provides shock-mounted protection for a 5¼-in. drive when transported between systems, and it includes a 100W power supply. It is priced at $970.

Sigma Information
3401 E. LaPalma Ave.
Anaheim, Calif. 92806
714-630-5417

Board-level devices

National Semiconductor Corp. has announced a series of facsimile boards designed for the IBM Personal Computer, Personal System/2 and compatible machines.

The Quadfax family will be marketed by the vendor's Quadram Products Group and was created to allow users to send and receive faxes directly through the personal computer, according to the company. The Quadfax-96, priced at $395, is targeted for the IBM PC, XT, AT and compatibles. The Quadfax-96m was developed specifically for the IBM Personal System/2 environment and costs $495.

Each board includes a 9.6K bit/sec. modem, and an optional command language programmer's tool kit is available.

National Semiconductor
P.O. Box 58090
Santa Clara, Calif. 95052
800-538-8510

Vermont Microsystems, Inc. has announced a personal computer graphics processor board designed to provide real-time three-dimensional graphics capabilities.

The X/Series reportedly provides as many as two full frames of eight color planes at a standard 1,280 by 1,024 dot/in. resolution, and expansion options are available.

The board renders 25,000 polygons per second and 200,000 two-dimensional vectors per second, and it supports Intel Corp. 80386- and 80486-based machines, the vendor said. The product is priced from $2,995.

Vermont Microsystems
11 Tigan St.
Winooski, Vt. 05404
802-655-2860

Macintosh products

Microtech International, Inc. has introduced a random-access memory expansion module used to increase the performance of Apple Computer, Inc.'s Macintosh Plus or SE.

The Step-up expansion module reportedly attaches to Microtech's 68020 accelerator board and provides 256K of 32-bit static RAM. The expansion module costs $699, and the 12-MHz 68020 accelerator is priced at $599.

Microtech International
29 Business Park Drive
Branford, Conn. 06405
203-481-6017

Peripherals

Panasonic Communications and Systems Co. has unveiled a wide-carriage, 24-pin dot-matrix printer.

Designated the KX-P1624, the device reportedly prints draft output at a maximum burst speed of 192 char./sec., and letter-quality output at 63 char./sec. The product also offers a graphics resolution output of 360 by 360 dot/in. The KX-P1624 is priced at $699.95, and an optional single-bin cut sheet feeder is available at a suggested retail price of $239.95.

Panasonic
Two Panasonic Way
Secaucus, N.J. 07094
201-348-7183

NEC Home Electronics (U.S.A.), Inc. has introduced four products for graphics processing.

The Multisync Graphics Engine multiple-resolution graphics adapter board was reportedly

Continued on page 62

© 1989 Hewlett-Packard Company 10028/07

Your systems just aren't keeping pace. Sometimes the information is late. Sometimes it's wrong. And in your business, having that kind of information is like having none at all.

Hewlett-Packard has a better way.

Transaction-processing systems that update, retrieve, and analyze data. Immediately. And accurately. Systems that are designed to respond easily to changes and growth in your company.

HP 3000 systems already process transactions for thousands of commercial businesses worldwide. And because every one of those businesses is different, the systems accommodate an impressive range of tailored applications from third party developers.

For one of the world's largest booksellers, an HP 3000 system manages every aspect of the company's phone and mail order business. When customers call regarding the status of an order, this system provides immediate answers 95% of the time.

And for a major athletic shoe company, Hewlett-Packard is providing solutions in the areas of inventory control and distribution. Over the past three years, HP systems have supported sales that have soared from $80 million to $700 million.

When you put a computer system in charge of critical data, reliability has to be more than a promise. That's why so many companies are backing every transaction with Hewlett-Packard. Because we've been promising and delivering exceptional reliability for over 50 years.

Timely, accurate information makes all the difference. To make a difference for your company, call 1-800-752-0900, Ext. 2362 for the HP sales office nearest you.

There is a better way.

HEWLETT PACKARD

Whatever the critical transaction, Hewlett-Packard can tailor a solution.

UnshakaBull

Bull renews its steadfast commitment to midrange customers with the new ultra-powerful DPS 6000 family.

KNOW BULL

Copyright © Bull Information Systems Inc. 1989 "UNIX is a registered trademark of AT&T"

Bull stands behind you by staying ahead.

Case in point: our new DPS 6000 family. It's an evolutionary power surge from our DPS 6 and DPS 6 PLUS families. It's a revolutionary launch pad to UNIX* operating systems.

Where else can you get the compatibility and multiprocessing advantages of our GCOS 6 HVS operating system plus 3 times the power of a DPS 6 PLUS, room for as many as 300 users, the best transaction processing value in the industry *and* the option of simultaneous peer processing. Which means access to one of the largest collections of commodity business applications available today.

Only one computer company lets you expand your processing power without limiting your options.

Know Bull.

1-800-233-BULL, ext. 140. Phone for a DPS 6000 product brochure.

Worldwide Information Systems

Bull

Continued from page 59

designed to boost the processing speed of graphics software. Compatible with NEC's Multisync line of monitors, it is said to provide up to 1M byte of video random-access memory (RAM) and 768K bytes of dynamic RAM. Prices start at $1,499.

Two Multisync color monitors, 5D and 4D, and a gray-scale monitor GS2A, are compatible with the engine board. The 20-in. 5D with a resolution of 1,280 by 1,024 pixels costs $3,699, and the 16-in. 1,024- by 768-pixel resolution 4D monitor costs $1,799. The 14-in. 800- by 600-pixel resolution gray-scale GS2A is priced at costs $349.

NEC Home Electronics
1255 Michael Drive
Wood Dale, Ill. 60191
312-860-9500

Seiko Instruments USA, Inc. has expanded its thermal printer line with a stand-alone portable model measuring 135mm by 100mm by 35mm and weighing 400g.

The cordless DPU-201G reportedly has built-in batteries and includes a charging unit. According to Seiko, the handheld printer features a 7 by 5 dot character matrix, prints at .8 lines/sec., has graphics capabilities and uses an input format conforming to the 8-bit Centronics parallel interface. A package that includes the printer, thermal paper, battery recharger and instruction manual is priced at $191 in quantities of 250-499 units.

Seiko Instruments USA
2990 W. Lomita Blvd.
Torrance, Calif. 90505
213-517-7770

Software applications packages

Retrieval Technologies, Inc. has announced a full text and image retrieval software program designed for use with magnetic media and compact disc/read-only memory applications.

Called Re:search, the product reportedly allows users to build personalized libraries from either scannable materials or information downloaded on-line from data services or word processing programs. The software requires an IBM Personal Computer AT or compatible with a minimum of 640K bytes of random-access memory and MS-DOS 3.0 or higher.

Re:search is priced at $695. Network licenses are available.

Retrieval Technologies
Building 100
1 Kendall Square
Cambridge, Mass. 02139
617-577-1574

Armor Systems, Inc. has released versions of its accounting software for Sun Microsystems, Inc. 386i workstations.

Excaliber + Premier is said to have networking capabilities and is available for both the Sun 386i/150 and 386i/250 workstations running under SunOS version 4.0 and higher. Thirteen applications are offered, including general ledger, accounts payable, accounts receivable and inventory control, and a separate application, Report Generator, creates customised reports.

Most modules retail for $995; Bank Reconciliation and Customer Information each sell for $595. Report Generator is priced at $1,095.

Armor Systems
324 N. Orlando Ave.
Maitland, Fla. 32751
407-629-0753

Chronologic Corp. has announced a memory-resident personal information manager for the IBM Personal Computer and compatibles.

Instant Recall reportedly runs in 32K bytes of random-access memory, accessible at a key stroke without having to exit other applications. According to Chronologic, information can be stored in four formats: free-form notes; task delegation and tracking; scheduling; and information about people and organizations. An information item is said to incorporate up to 65,000 characters, and any one of the possible multiple databases can hold up to 100 million characters.

Requiring DOS 3.0 for the memory-resident operation and a 720K disk capacity, the price is $99.

Chronologic
Suite 210
5151 N. Oracle
Tucson, Ariz. 85704
602-293-3100

In Alabama, one of the world's leading medical centers is staffed by a bunch of country doctors.

The University of Alabama at Birmingham co-sponsored this ad with the State of Alabama

They serve the whole country—and the world.

The following comments are by Charles A. McCallum, M.D., President of the University of Alabama at Birmingham.

"A specific goal was set when our medical center was founded. That goal was to be, not just another state institution, but a national resource.

"We've quickly attained a national and international reputation. In every book that judges hospitals, the University of Alabama at Birmingham hospital rates among the best.

"More than a score of highly recognized centers of excellence have been developed at this university, including a Comprehensive Cancer Center, a cardiovascular research training center, and a multipurpose arthritis center—to name just three.

"We've pioneered such innovations as our Medical Information System. Doctors can call here, toll free, to discuss their patients' problems with our doctors. We respond to over 71,000 calls a year.

"And our critical care transport system can bring patients here quickly and safely. We can transport them in our jet while giving them all the care they would get in a surgical intensive care unit.

"By working to be the best anywhere, we're helping to make Alabama the best state to live in."

ALABAMA
The Great Surprise.

Alabama Development Office, State Capitol, Montgomery, AL 36130. Call Toll Free 1-800-248-0033.

Meet the #1 Software for a Growing Family

The more you rely on the expanding family of VAX™ computers, the more you need the SAS® System—the leading data analysis and graphics software in the VAX market. No other software has the power and flexibility to handle *all* your data management, analysis, and presentation needs. Across the entire range of VAX systems.

The SAS System brings you more choices for data entry, retrieval, and management . . . report writing and graphics . . . statistical and mathematical analysis (including quality control) . . . business planning, forecasting, and decision support . . . operations research and project management . . . and applications development. All fully integrated. All backed by VMS–specific technical support, training, and documentation.

And now we've extended the family with specialized tools for evaluating VAX computer performance, as well as interfaces to popular data bases such as ORACLE® and Rdb.™ No wonder experts call the SAS System "... perhaps the most sophisticated and versatile family of products on the market."*

Yours for 30 days . . . FREE

Find out why the SAS System is the software you won't outgrow. Ask for our free 12-page executive summary and details about a free 30-day software evaluation. Call us today at (919) 467-8000. In Canada, call (416) 443-9811.

*Digital Review. Reprint available.

The SAS System runs on the entire family of VAX minicomputers and workstations under VMS. Mainframes, personal computers, and UNIX-based workstations from other vendors are also supported.

SAS is a registered trademark of SAS Institute Inc. VAX, VMS, and VAX Rdb/VMS are trademarks of Digital Equipment Corp., and ORACLE is a registered trademark of Oracle Corp.

Copyright © 1989 by SAS Institute Inc.
Printed in the USA.

digital™ Cooperative Marketing Program

The SAS® System. More Choices for More Applications than Any Other Software.

SAS.

SAS Institute Inc.
SAS Circle □ Box 8000
Cary, NC 27512-8000
Phone (919) 467-8000
Fax (919) 469-3737

want

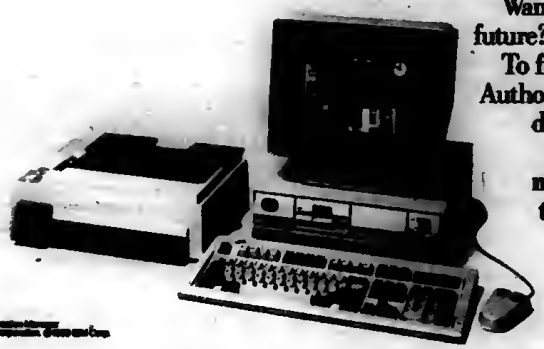
to move into the future without letting go of the past.

OS/2 can do!

Making the move to OS/2® isn't all or nothing. In fact, OS/2 and DOS can work together—in the same office, on the same network and even on the same workstation. So it's easy to protect your current hardware and software investment.

The key is compatibility. You can take advantage of powerful new OS/2 software, run most of the top DOS applications or toggle back and forth as the tasks demand it. A dual-boot feature also allows you to choose a pure DOS or OS/2 environment at any time.

And don't be surprised that most of your favorite DOS applications are now available for OS/2. They've been redesigned and go beyond DOS memory limits to provide additional functions that help you be more productive—with the benefits of multitasking and OS/2's graphical interface, Presentation Manager.™



Want to keep what you have and still move into the future? With OS/2, the solution is IBM.

To find out more about OS/2, contact your IBM Authorized Dealer or marketing representative. For a dealer near you, call 1 800 IBM-2468, ext. 205.

Choose OS/2 now and get rebates on memory and software. Also get an upgrade to Version 1.2 free until December 31, 1989.

IBM

Sapana Micro Software has upgraded its mailing list management packages for IBM's Personal Computer AT, PC Convertible, Personal System/2 and most compatibles.

Features of Mail-Track II and Mail-Track III reportedly include a utility that creates mail application templates and report-generation formats, 10 levels of duplicate detection operation and a faster sorting method.

Not copy-protected, Model II sells for $95, and Model III is priced at $195. Owners of older versions can upgrade by sending $19 and their original diskettes to the company.

Sapana Micro Software
1305 S. Rousse
Pittsburg, Kan. 66762
316-231-5023

Panacea, Inc. has announced a software product designed to support the IBM 8514/A graphics adapter at the register level.

The Display List Driver 8514/A for Autocad replaces the driver that comes with Autodesk, Inc.'s Autocad Release 10, increasing redrawing, zooming and panning performance. It also supports Autodesk's Autoshade and Autosketch.

Available in September, the introductory price is set at $149.

Panacea
Londonderry Square
Suite 305
50 Nashua Road
Londonderry, N.H. 03053
603-437-5022

Autodesk, Inc. has released a desktop video application for IBM Personal Computers, Personal System/2s and compatibles. Autodesk Animator is an animation and paint program that can be used for developing sophisticated animated presentations for video applications. The program offers five types of animation techniques, image processing, 572 color paint effects, a mouse interface and video-connection capabilities.

The price is listed at $299.

Autodesk
2320 Marinship Way
Sausalito, Calif. 94965
415-332-2344

Caddylak's Take Stock *tracks inventory in many categories*

Caddylak Systems, Inc. has unveiled a retail inventory management system.

Take Stock is a menu-driven program capable of storing up to 3,200 items on a hard disk in 19 inventory categories. It can also print out 10 different reports, labels and purchase orders and give the total value of an inventory. The list price is $89.95.

Caddylak
P.O. Box W
131 Heartland Blvd.
Brentwood, N.Y. 11717
516-254-2000

Compass Systems Corp. has announced a multifunction software package developed for the inventory process. It is designed specifically for National Datacomputer, Inc.'s MS-DOS handheld device.

Called Intakes, the software reportedly includes financial and audit verification functions and provides for location, department and item category segregation for the counting process. The menu-driven software is said to support universal product code methodologies and to provide uploading capabilities from the National Datacomputer device to a personal computer for further processing. Pricing for the total system, including the Datacomputer machine, begins at $3,700 for the 128K-byte configuration.

Compass Systems
Suite 405
2714 Union Ave. Extended
Memphis, Tenn. 38182
901-458-5732

Oakland Group, Inc. has announced the release of Versions 3.1 of both its Look & Feel screen designer and its C-Scape interface management system.

Look & Feel is designed to allow the user to create screens and convert them into C source code. C-Scape is a programming library intended to help programmers design data entry, menu, Help and text screens.

MS-DOS and OS/2 versions of both programs cost $399.

C-Scape and Look & Feel cost $299 and $149 respectively.

Oakland Group
675 Massachusetts Ave.
Cambridge, Mass. 02139
617-491-7311

Voyetra Technologies has upgraded its series of music software for the IBM Personal Computer.

Version 3 of Sequencer Plus reportedly contains sequencing software integrated with Voyetra's librarian, Musical Instrument Digital Interface data analyzer program and network organiner. According to the company, the library functions are predefined for nearly 100 instruments from more than 20 manufacturers. The package sells for $349.

Voyetra Technologies
333 Fifth Ave.
Pelham, N.Y. 10803
914-738-6946

Computer Support Corp. has added support for color tagged image file format (TIFF) Version 5.0 to its Arts and Letters Graphics Editor Version 2.0.

Version 2.0 of the Bezier curve illustration program reportedly lets users import and export color images in TIFF, a standard used in scanner software and paint programs. According to the vendor, the user can merge the scanned photographs and bitmapped artwork with Bezier curve-based illustrations, clip art and outline typefaces that are already available with the editor and can print them on devices supported by Microsoft Corp.'s Windows. Version 2.0 sells for $695.

Computer Support
15926 Midway Road
Dallas, Texas 75244
214-661-8960

P&W Software, Inc. has released software for employee benefit management on IBM Personal Computer ATs or compatables.

The Powerplus family of software is based on the Employee Data Management System (EDMS), which allows specific application modules to be added or subtracted and communicates with other databases and personnel systems, the company said.

According to the firm, plug-in modules now available include Highly Compensated Employees Determination (HCED) and Flex-Spending Account administration. Prices for EDMS and the HCED module are $650 and $500, respectively.

P & W Software
Suite 403
5655 Lindero Canyon Road
Westlake Village, Calif.
91362
818-707-7690

Software Business Technology Corp. (SBT) has upgraded its series of accounting software to provide more flexibility and ease for the user.

Version 6.3 of the Series Six Plus Database Accounting Library reportedly features changes in the user interface, redesigned user manuals, automatic installation, light bar menus and flexible data file directories. Programs are available for the general ledger, accounts receivable, accounts payable, purchase orders and sales orders at $595 each. The packages run under MS-DOS, Xenix and Unix, support both single and multiuser or local-area network systems and include source code. Compiled single-user programs that do not include source code retail for $295 each.

SBT
One Harbor Drive
Sausalito, Calif. 94965
415-331-9900

Levenbach Associates, Inc. has released an updated version of its forecasting software product for users of Lotus Development Corp.'s 1-2-3 and Symphony spreadsheets.

Autocast II/Batch2 was designed to access spreadsheets directly on the personal computer's hard disk, the vendor said. The package reportedly allows users to forecast thousands of stock-keeping units, budgetary items or product sales in a single run. It is priced from $2,900, and customization, support and training are available.

Levenbach Associates
Suite 348
103 Washington St.
Morristown, N.J. 07960
201-285-9248

Bloc Publishing Corp. has released a rewritten version of its Fastpak Mail software package.

According to the company, Version 4.0 includes mailing list management functions supporting as many as 64,000 names and now offers simplified preparation functions for both customized letters and bulk-mail applications. The program supports most dot-matrix and daisywheel printers as well as all Hewlett-Packard Co. laser printers and compatible machines.

Fastpak Mail 4.0 runs on IBM Personal Computers, Personal System/2s and compatible systems and carries a suggested retail price tag of $79.95.

Bloc Publishing
Suite 765
800 S.W. 37th Ave.
Coral Gables, Fla. 33134
800-888-2562

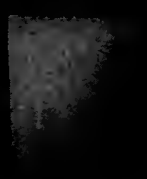
THE BEST
INVESTMENTS IN THE EUROPEAN MARKET

High-quality, innovative electronics developments await perceptive buyers. Pre- and post-prototype opportunities are available. One of our products:

• continuous digital oscilloscope, logic analyzer, pattern generator, frequency counter
• 1.5µ drawn gate length, 0.8µ channel length • 2-layer metal HCMOS technology
• 30,000 gates used

PIXEL

PostScript laser printers used to be expensive, large and shared by an entire office.



Until now.

microLaser from Texas Instruments: the affordable PostScript printer users can call their own.

Finally, for less than $3,000* users can have a PostScript laser printer right at their desks. TI introduces its new microLaser, with the features users want – now and in the future.

Small size. Lots of value.

At only 13.4 inches wide and 14.2 inches deep, microLaser may be the small kid on the block, but it packs plenty of punch. This printer takes full advantage of powerful PC software. That's because it uses the Adobe® PostScript printer language and is compatible with the HP LaserJet® Series II – allowing the user to switch between them easily. With that kind of flexibility, the six-page-per-minute microLaser is ideal for word processing, spreadsheet and desktop publishing applications.

Because microLaser features the PostScript language, it prints fonts in a variety of type styles and sizes. Plus, it can print them tall-ways, long-ways, all kinds of ways. It even prints complex pages of integrated text and graphics.

Capabilities that grow as their needs grow.

One of the best things about microLaser is that users only buy what they need. So if they're not ready for PostScript language, they can buy the standard microLaser for less than $2,000** and add PostScript software and other powerful features later.

Users can upgrade microLaser without tools or technicians by simply adding upgrade boards. These boards include up to four 1 Mb increments of memory, serial and AppleTalk® interfaces and a PostScript interpreter. All they have to do to get additional fonts or emulations is plug optional microCartridges into two credit card-size slots.

Superior paper handling.

Part of what makes microLaser a truly personal, desktop laser printer that takes up so little room is its paper drawer, which slides *inside*. Because microLaser holds *250 sheets* standard (it holds 500 with an optional paper drawer), users spend less time refilling paper and more time creating superb-looking documents.

The printer also handles a variety of paper sizes and types – from letter, legal and executive to transparencies, labels and envelopes. For those times when users face a large mail merge task, they can just plug in an optional envelope feeder to easily alternate between letters and envelopes.

FREE! Adobe typefaces from TI.

What could be more affordable than that? When users purchase a TI microLaser with PostScript, they get their choice of an Adobe Publishing Pack for their PC or Macintosh® (up to a $475 retail value). Selected by publishing experts, each Pack features three high-quality Adobe typefaces proven to work well together in a specific application, such as newsletters, forms and schedules or presentations.

Not only that, they get an expert-written "How To" booklet so they can get started quickly and easily.

Call TI at 1-800-527-3500 for details! This offer ends March 31, 1990.

POSTSCRIPT

The affordable PostScript printer is a call away.

To find out more about how your users can have affordable PostScript printing right at their desks, call TI today.
1-800-527-3500.

*TI suggested list price is $2,999.
**TI suggested list price is $1,999.

TEXAS INSTRUMENTS

©1989 TI 62128

Standard microLaser is HP LaserJet II-compatible, prints six pages per minute and comes with 5 Mb of RAM. microLaser PS has the same features as the standard microLaser, plus an Adobe PostScript interpreter with 35 typefaces and 1.5 Mb of RAM.
Adobe, PostScript and the PostScript Logo are registered trademarks of Adobe Systems, Inc. LaserJet is a registered trademark of Hewlett Packard, Inc. AppleTalk and Macintosh are registered trademarks of Apple Computer, Inc.

Now there are two ways to drive your network on a 386.

Manual. Automatic.

Novell went to a lot of effort to get NetWare™ to perform on a 386™ Microprocessor. But you'd have to go to considerably more effort to get it to perform like VINES.®

Unlike its competitors VINES is based on an international standard, UNIX.® So applications and communications programs are easy to integrate. That's why capabilities for E-mail, X.25, SNA and async are already included. And since VINES was built from the start to integrate anything from a PC cluster to an enterprise-wide network, it has one big advantage. A global naming system called StreetTalk.™

Which is nothing new to the VINES users who've been enjoying proven 386 performance for over a year. But to those who are still waiting for NetWare to catch up, remember, it's never too late to shift gears.

BANYAN Networks for those who think big.

See us at Comdex - Booth H7150

Banyan Systems, 115 Flanders Road, Westboro, MA 01581 · 1-800-828-2404

VINES is a registered trademark and StreetTalk is a trademark of Banyan Systems, Inc. UNIX is a registered trademark of AT&T. NetWare is a trademark of Novell, Inc. 386 is a trademark of Intel Corporation.

DATA STREAM

Elisabeth Horwitt

In search of CIM reality

For the past few years, I have gone to the Autofact conference for an update on whether computer-integrated manufacturing (CIM) is finally becoming a technically viable, business-justifiable discipline instead of an amorphous mass of conflicting aims and half-baked products.

Walking the floors of this year's show, I reluctantly concluded that manufacturing and engineering managers are still struggling to anchor their CIM dreams to a reality. The difference is that they finally seem to be admitting they need help — from outside consultants and even from their own internal IS departments. This seems like very good news.

Most existing CIM projects arose from the shop floor and are

Continued on page 82

Inside

- Switch gives PCs ISDN PRI capacity. Page 74.
- FDDI deployment not as speedy as its promised capabilities. Page 74.
- NCR hooks up with Novell Unix software. Page 75.

Users hail Tariff 12 decision

ANALYSIS

BY MITCH BETTS
CW STAFF

WASHINGTON, D.C. — Sure, it was a victory for AT&T when the Federal Communications Commission (FCC) upheld the legality of Tariff 12 last month. Tariff 12 is AT&T's weapon in the highly competitive battle for custom business networks.

But more importantly, it was a victory for users, according to Henry D. Levine, an attorney at Washington-based Morrison & Foerster who represents a slew of major user companies.

The user victory came on several different levels. Obviously, the fact that Tariff 12 remains in effect means that the 19 companies with Tariff 12 contracts — from Du Pont Co. (Option 1) to National Semiconductor Corp. (Option 19) — are relieved to know that they do not have to rip out their networks.

Second, the FCC action means that Tariff 12 is open to more users, unless it is overturned in court. AT&T predicted at least 50 more Tariff 12 customers by the end of 1990.

Third, it was a victory for the user community's vision of competition in the high end of the market, Levine said. In other words, users have enjoyed watching AT&T, MCI Communications Corp. and U.S. Sprint Communications Co. scramble to offer more sophisticated and cheaper services to the Fortune 500.

"Users have always tended to let this be a fight between AT&T and its competitors and to stand on the sidelines. But over the last six months, users have begun to see very substantial benefits from the competitive marketplace [for custom network contracts], and they wanted very much to preserve that competition," he said.

In mid-October, when there were rumors that the newly appointed FCC might place new restrictions on Tariff 12 contracts, the users sprang into action. Seventeen large users, rounded up by Levine, sent a letter urging the commission "not to fix something that is not broken."

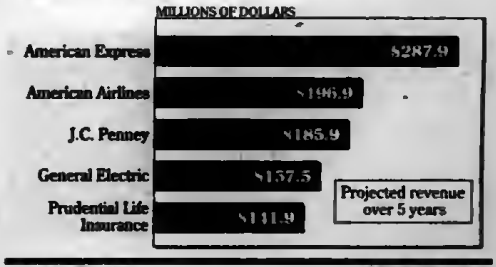
Some of the letter signers were AT&T customers, such as Tariff 12 user Prudential Life Insurance Company of America. But other signers included Merrill Lynch & Co., Chrysler Corp. and Chase Manhattan Bank NA — three major customers of MCI — and Bankers Trust Co., which is one of U.S. Sprint's biggest customers.

In other words, MCI and U.S. Sprint customers supported Tariff 12 even though their carriers strongly opposed it and are fighting it in court. The letter said that users are united in their opposition to all efforts to interfere with the current trend toward competition, whether directed at AT&T or its competitors. For example, they also opposed AT&T's pending complaint against MCI's off-tariff deals [CW, Sept. 25].

Continued on page 75

Major commitments

The top five Tariff 12 customers each have contracts with AT&T worth more than $140 million



SOURCE: MORRISON & FOERSTER

CW CHART: FRANK C. DICOVELL

Mac network developers expand TCP/IP horizon

BY JAMES DALY
CW STAFF

SAN JOSE, Calif. — Novell, Inc. announced recently that it will add Apple Computer, Inc.'s MacTCP driver to its TCPort Developer's Toolkit, thus allowing Macintosh networking developers to write to their choice of either company's Transmission Control Protocol/Internet Protocol (TCP/IP) drivers.

Prior to the pact, developers writing to the TCP/IP-Macintosh environment needed to write separate applications to each noncompatible driver, significantly lengthening both the development process and the time to market.

The driver is a piece of system software that takes requests from an application, provides a protocol and puts it out on the network.

The full product will be released in January by Novell subsidiary Excelan, Inc.; with site license and commercial development fees beginning at a price of $2,500.

The pact continues Apple's move to broaden its range of connectivity products. Novell's Netware operating system has become a standard for many personal computer local-area networks.

Last June, Apple revealed a wide-ranging suite of networking tools specifically designed to speed the Macintosh's entry into both IBM Personal Computer and Digital Equipment Corp. environments.

400 Page-Per-Minute Performance on DECNet, Token-Ring or other LANS

Spur PAGE PRINTER CONTROLLER

Introducing the high-performance page printer controller from Spur Products that allows you to place your page printer on a network. The PPC supports printers up to 400 pages per minute!

•LAN Connectivity to DECNet, Token-Ring, Ethernet and others
•Print Job Queing •Unattended Operation or Remote Operator Control
•Custom FCB & UCSB Loads
•Custom Translation Tables
•On-Screen Menu-Driven Applications Software Included

•Quality High-Performance Printer Interfaces Since 1972•

SPUR PRODUCTS CORP.
1222 EAST GRAND AVENUE
EL SEGUNDO, CA 90245
TEL: (213) 322-0012
FAX: (213) 322-1454

The Rockies Gibraltar But Your Data

3M diskettes, data cartridge tapes, computer tapes and rewritable optical disk cartridges. If you think some things in life are worth keeping-like the results of your hard work-we have a simple solution. Put your data on 3M media. It's rock solid.

May Crumble, May Tumble, 's Here To Stay.*

Come see us at Comdex, Booth #1742.

For more information about 3M's full line of data storage products, phone 1-800-888-1889 ext. 15.

*©1938 CHAPPELL & CO. (Renewed) All Rights Reserved. Used by Permission.

3M

Commtex unwraps PRI desktop link

BY JOANIE M. WEXLER
CW STAFF

In a move that brings 1.5M bit/sec. Integrated Services Digital Network (ISDN) connections to the desktop, Commtex, Inc. last month enhanced its CX-80 3174 cluster controller/data switch to allow IBM Personal Computer XT and PC AT users to send and receive voice, data and full-motion video over an ISDN Primary Rate Interface (PRI).

The interface supports 23 B channels running at 64K bit/sec. plus a D channel for signaling and packet-switched transmissions.

The vendor demonstrated an IBM PC running a Lotus Development Corp. 1-2-3 training video, while a window on the computer identified the source of an incoming telephone call and a PC user performed keyboard tasks.

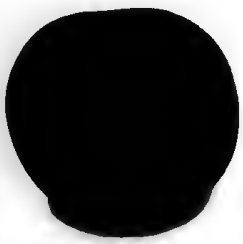
A number of existing offerings provide the desktop with the narrower bandwidth of an ISDN Basic Rate Interface. However, PRI connections have been limited to linking private branch exchanges to one another, to hosts or to the public network.

To make the PRI connection, users must purchase a $4,995 line interface module, which resides in the CX-80 and supports five PCs and one server, as well as a $1,995 CX-Card. To add voice and video functions, they must also buy a $695 Voice Subsystem and $2,500 television option for each PC.

Regarding the pricing, Chief Executive Officer Don Parker noted that the company's strategy is to offer customized turnkey packages at discount prices that total less than the sum of all the components.

The revised CX-80 uses time-division multiplexing to allocate PRI bandwidth to the voice, data and video functions. PRI links can also run from each networked PC to a file server and from the file server to the CX-80 so that resources can be shared among PCs. A PRI link can simultaneously connect users to Centrex, a corporate backbone and other CX-80s, with each PC able to use the full PRI link.

GOD DIDN'T MAKE LITTLE BLUE APPLES.
KMW DID.



KMW brings Apple and Big Blue together. KMW makes your Macintosh more versatile – more *productive* – by linking it to your IBM midrange. Our line of TwinAxcess™ protocol converters connects any Macintosh to your System/3X or AS/400.

New board connection for the Mac II. For a simple, cost-effective board solution, choose our TwinAxcess for the Mac II. This easy-to-install card plugs into any member of the Mac II family, with connection to your host through twinax cable.

Field-proven multiport products. Our TwinAxcess Series II and Series III protocol converters are ideal when you need remote attachment capabilities, or when you need support for up to seven devices. TwinAxcess system-level protocol converters provide midrange connections for any Macintosh, as well as IBM PCs and compatibles, laptops, ASCII terminals, and most popular printers. We can also help you connect to a mux, a data PBX, AppleTalk, or DECnet.

Powerful features on every level. TwinAxcess protocol converters benefit your Macs, your other peripherals, and your host, with these features:

- file transfer to and from your host
- terminal emulation
- manipulation of IBM midrange data within software programs such as Excel, Lotus 1-2-3, and MacWrite
- access to your host's mass storage capabilities
- printer pass-through to ImageWriter and LaserWriter

We'd like to give you more information on all of our connectivity choices. Call KMW today at our toll-free number below.

(800) 531-5167
In Texas, (512) 338-3000
In Europe, 44 1 844 1525

KMW SYSTEMS CORPORATION

See us at COMDEX BOOTH A534 Cashman Field Center

TwinAxcess is a trademark of KMW Systems Corporation. All other brands are trademarks or registered trademarks of their respective holders. © 1989 KMW Systems Corporation

FDDI still in holding pattern

BY JOANIE M. WEXLER
CW STAFF

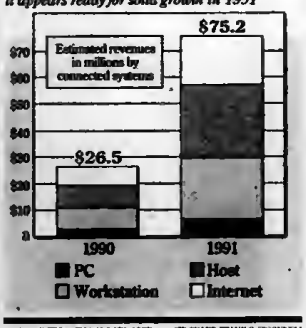
FRAMINGHAM, Mass. — Despite the recent wave of FDDI product introductions and demonstrations, widespread deployment of 100M bit/sec. fiber networks is likely to remain on the horizon for another two years, according to a recent report by market research firm International Data Corp. (IDC).

IDC said that large-volume end-user Fiber Distributed Data Interface (FDDI) sales will not take off until at least 1991 because of high prices, limited availability of concentrator products and a shortage of commercial applications.

The dual attachment to an FDDI network accounts for much of the current prohibitive $8,000 to $12,000 cost per connection, according to IDC analyst Richard Villars.

Almost ready

The market for the Fiber Distributed Data Interface has not taken off as expected; however, it appears ready for solid growth in 1991



SOURCE: INTERNATIONAL DATA CORP. CW CHART: FRANK C. O'CONNELL

Concentrators that allow a single attachment to FDDI's dual, counterrotating ring should bring the price per connection down to about $5,000 to $8,000, he said, when they become available in the 1991 to 1992 time frame.

IDC's FDDI study, based on a survey of vendor plans and projected growth figures in the technical workstation market, identifies two major market segments in which FDDI will initially be offered: end-user systems (technical workstations and PCs) and backbone networks.

For FDDI to become useful in the technical workstation market, according to Villars, vendors must develop commercial applications that take advantage of the technology's 100M bit/sec. bandwidth. Currently, he said, demand for the high throughput afforded by FDDI has been limited to the aerospace, electronics, government and educational markets, in which users have committed themselves to developing their own customized applications.

Another development needed to fuel the growth of FDDI, according to Villars, is that vendors of backbone FDDI network products, such as bridges and routers, must ensure that their products are compatible with one another. Also, Villars said, vendors must introduce network management capabilities for current systems to support FDDI.

Tariff 12

FROM PAGE 71

In the end, the FCC decided to leave Tariff 12 alone by denying the petitions for reconsideration [CW, Oct. 30]. The commission apparently added language re-emphasizing that Tariff 12 is not a "blank check," and its options must be generally available to other customers. However, observers said that may have been window dressing to strengthen the FCC's case in court.

The victory also demonstrated the user community's lobbying clout. The letter from 17 users "may have been a factor that bolstered the commission's resolve," Levine said. "I believe the FCC was impressed that this was no longer just a fight between big carriers, but that, in fact, the customer community was saying: Don't mess with this marketplace."

Over the years, the FCC has "always been a little frustrated that it always hears from the industry, as opposed to users. So when users come in with a loud voice . . . that has gotten a good hearing," Levine added.

Now, the battle over Tariff 12 shifts to the U.S. Court of Appeals for the District of Columbia, where MCI, U.S. Sprint and the Independent Data Communications Manufacturers Association (IDCMA) have filed appeals seeking to overturn the FCC policy.

The critics have argued that Tariff 12 is illegal on a variety of grounds. MCI, for example, said it is "ludicrous" to believe that the Tariff 12 options (designed with specific customers in mind) are generally available, as required by law.

MCI further objected to Tariff 12 as a "facade which simply allows AT&T to target special discounts to specific customers and to tie or bundle unregulated services [such as free or discounted equipment] with regulated services to sweeten the deal," the company said in a prepared statement.

Critics also want AT&T to disclose more details about Tariff 12 contracts. The IDCMA complained that systems integrators have difficulty competing for the equipment portion of user networks when AT&T is allowed to have "secret prices" for its equipment hidden in Tariff 12 contracts.

"AT&T must not be allowed to use its market position in the telecommunications equipment business to advance its transmission service sales," MCI added.

In essence, the appeals court will have to decide whether — as the IDCMA put it — the FCC has taken a radical departure from its rules that require complete disclosure of carriers' rates and that prohibit unreasonable discrimination among users.

NCR Tower to serve PC nets

NEW YORK — NCR Corp. recently became the first hardware vendor to team with Novell, Inc. and deliver a product based on the local-area network leader's network software for Unix-based systems.

NCR has licensed Portable Netware to provide what it is calling Tower Netware. The software will allow Unix-based Tower systems to act as servers to networked personal computers, including DOS, OS/2 and Apple Computer, Inc. Macintosh systems. Alternatively, the Tower systems could be used as Unix processors running Unix applications.

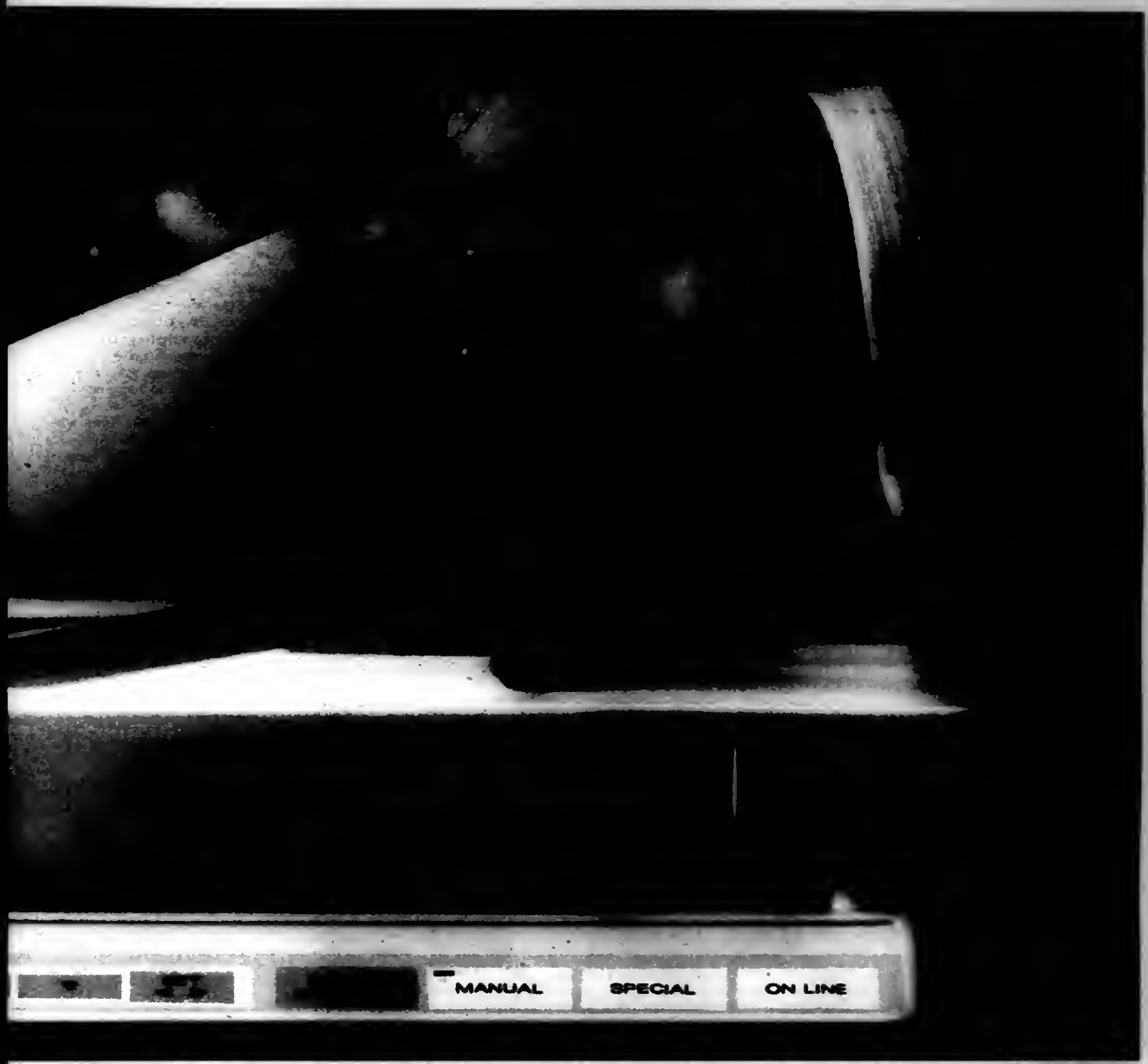
NCR is the first to reach market with a Portable Netware implementation. Several hardware vendors, including Data General Corp., Prime Computer, Inc., Hewlett-Packard Co. and Unisys Corp., expressed support for the product when it was announced last March.

There were concerns whether Portable Netware would be compatible with its PC predecessor, the Netware 386 operating system. Although there are differences, an NCR official said, "You would have to be a microscopic expert to see them."

Several software vendors hailed the announcement as a step forward in bridging the Unix and PC-DOS worlds.

Epson EPL-6000. HP emulation. 300 x 300 DPI. 6 PPM. 512KB RAM, expandable to 4.5MB. 6 resident fonts. Two option font slots. Enhanced SelecType control panel. One year limited warranty.

UNTIL NOW, LASER PRINTING HAS BEEN OUT OF REACH FOR MANY PEOPLE IN BUSINESS.



HP LaserJet II is a registered trademark of Hewlett-Packard. Epson is a registered trademark of Seiko Epson Corporation. Epson America, Inc., 2780 Lomita Blvd., Torrance, CA 90505. (800) 922-8911.

With the new, affordable EPL-6000 from Epson, more businesses will be looking better on paper.

Opting for the quality of a laser printer has just become decidedly easier. Introducing the EPL-6000 laser printer from Epson.

Coming from the company with the longest-running success in the printer business, reliability is a given. What's more, the new EPL-6000 is compatible with application software written for the HP LaserJet II.

As for value, this new Epson combines solid, businesslike performance with a price that is as attractive as the printing. In fact, for quality, reliability and value in a laser printer, you could say Epson has the solution well in hand.

EPSON

WHEN YOU'VE GOT AN EPSON, YOU'VE GOT A LOT OF COMPANY.™

Intensive care for fragile LANs

Local-area network diagnostic tools are growing both in number and level of sophistication, offering users a possible solution to increasingly serious LAN maintenance problems, according to a white paper issued by the consulting firm Arthur D. Little, Inc.

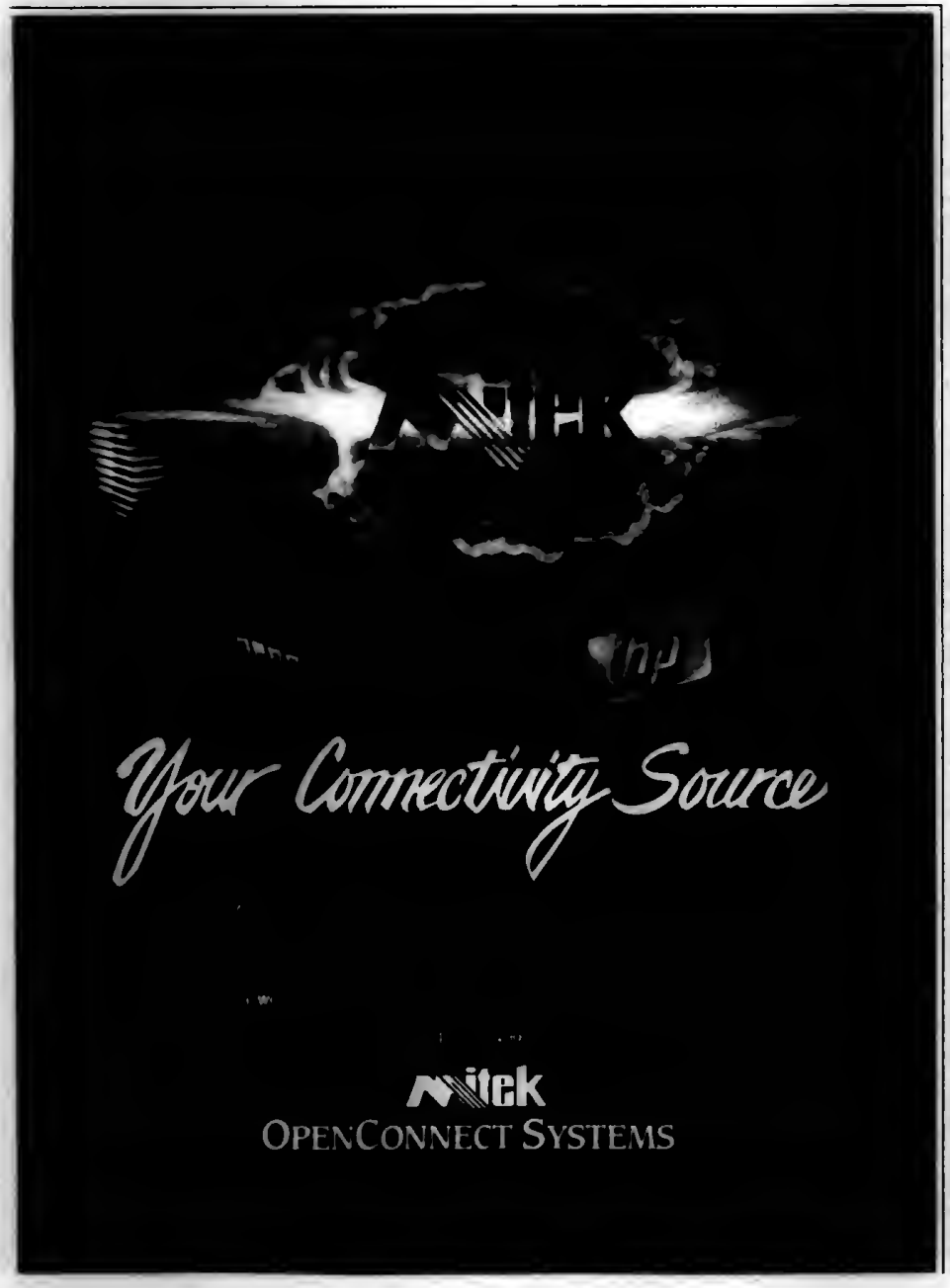
Corporations have found personal computer LANs to be "both hostile and fragile," wrote ADL senior partner Harold Cypress in a white paper he co-authored with ADL senior consultant Gilbert Hoxie.

Rapidly evolving LAN technology has left many users behind and made them cautious about changing a configuration once it is up and running, according to the authors, who said they interviewed over 100 users.

Users and vendors are in dire need of better LAN support tools, the authors said. "The average PC user on or off [the] LAN already has to spend something upwards of 25% to 30% of his time in nonproductive activities associated with acquiring technology, reorienting to applications, dealing with files, backup, diagnostics and troubleshooting," Cypress said.

An emerging generation of LAN-oriented diagnostic tools, of which Network General Corp.'s The Sniffer was an early example, could address that need, Cypress noted. However, such products should not simply add to users' nonproductive activities, he added.

ELISABETH HORWITT



Cures offered for LAN woes

BY ELISABETH HORWITT
CW STAFF

The local-area network diagnostic industry, which has long lagged behind other network management arenas, has gained momentum in recent months with a spate of products designed to provide the reliability users need to safely tie LANs into the corporate network. Among the recent announcements are the following:

Network General Corp. in Mountain View, Calif., has announced Sniffer Express, a rental program designed to provide users with overnight access to a Sniffer network diagnostic device when trouble develops on their LANs. The high-end Series 500 Sniffer can be rented for $1,000 per week, the company said.

A software program that allows Novell, Inc. Netware system administrators to access the screen and keyboard of any personal computer on a network from the administrator's workstation was announced by Lan Systems, Inc. in New York. Dubbed Lansight, the program reportedly permits administrators to assess the condition of a remote PC by running memory analysis and other diagnostic programs directly from the workstation. The product costs $395 per server. Deliveries are scheduled to begin this month.

Vance LAN enhanced

Vance Systems, Inc. in Chantilly, Va., announced enhancements to its ATS 1000 Token-Ring LAN Analysis System that are said to allow the product to capture and analyze data for both 16M bit/sec. LANs and IBM's Systems Network Architecture (SNA).

Priced at $17,995 and scheduled to ship in the first quarter of next year, the baseline 16M bit/sec. ATS 1000 includes an IEEE 802.5 network interface, MS-DOS-based microprocessor, a 40M-byte fixed disk and software for collecting and analyzing the lower-layer LAN protocols, Vance said. An upgrade from a 4M bit/sec. ATS 1000 costs $4,000.

The SNA diagnostic feature is said to decode SNA protocols that correspond to Layers 3 through 7 of the International Standards Organization's Open Systems Interconnect model, including IBM LU2.0 and LU6.2 commands.

Hewlett-Packard Co. introduced software packages that are said to allow its HP 4972A LAN protocol analyzer to handle Digital Equipment Corp. Decnet, Transmission Control Protocol/Internet Protocol (TCP/IP) and Sun Microsystems, Inc.'s Network File System.

The HP 18225A Decnet performance analyzer is said to track individual node performance and traffic characteristics, as well as to isolate problems by spotting erroneous packets, on a Decnet network. The HP 18224A Decnet protocol interpreter is said to provide full-text descriptions of protocols on that network.

HP also introduced the HP 18222A TCP/IP network performance analysis package and the HP 18228A Network File System protocol interpreter.

Each of the above products is priced at $950 and runs on the HP 4972A LAN protocol analyzer, which costs $17,350.

Slices of CIM shown at Autofact conference

BY ELLIS BOOKER
CW STAFF

DETROIT — A comprehensive demonstration of computer-integrated manufacturing (CIM) at the recent Autofact '89 conference was as much an exercise in cheerleading as in technology.

Arranged by Autofact's sponsor, the Society of Manufacturing Engineers (SME), the Partnership for Integration exhibit seemed to respond indirectly to the impression held by some that CIM is a better idea in theory than in practice. Users who have tried to put CIM in place have complained about its high up-front costs, notably the need to customize interfaces in multivendor environments.

The Partnership demonstration simulated interconnections among a lawn tractor company's retail outlet, a corporate office and a manufacturing shop floor. Visitors saw a request for a single part assembly move electronically among the multiple hardware and software platforms, networks and operating systems. In all, 21 vendors participated in the exhibit.

However, the 8,000-square-foot demonstration had to be complex, noted Bruce Gengler, technical manager of computer-aided manufacturing services at Deere Tech Services, which acted as the systems integrator for the project.

> "WE HAVE IDEAS [on how to link the two systems], but I'm always warning people that if you can't manage your factory today manually, you can't do it on computer."
>
> LARS F. ROJEL
> SABROE MANUFACTURING

Gengler said the demonstration was deliberately designed to be complex and all-encompassing to demonstrate the possibilities of CIM. "Users should see that they can implement CIM by the slice," he said.

The systems were connected over a mixture of Transmission Control Protocol/Internet Protocol (TCP/IP) and Decnet communications software running on top of Ethernet, X.25, IBM Token-Ring and broadband facilities.

However, the Manufacturing Automation Protocol (MAP), an evolving Open Systems Interconnect-based communications protocol, was not anywhere to be found.

While the latest implementation of the standard — MAP 3.0 — could have simplified connections between hardware systems, according to Gengler, SME rules forbid the use of unannounced products in technical demonstrations. Gengler said that when the exhibit was being planned, neither IBM nor Digital Equipment Corp. — two of the largest participants in the Partnership exhibit — had announced support for MAP 3.0. Both vendors announced support for MAP 3.0 last month.

While the demonstration incorporated a number of widely implemented networking standards, including the X12 format for electronic data interchange and X.400 for messaging services, a great deal of customization went into linking the networks and software systems. Gengler said the demonstration had taken the assembled vendors and systems integrators a full year to produce.

Waning expectations

The pared-down definition of CIM is new and may reflect the diminishing level of expectations for CIM. Traditionally, CIM has been understood as an enterprisewide, not departmental-level, architecture.

On the other hand, CIM by the slice is more in line with European methods, according to Lars F. Rojel, a systems engineer at air compressor maker Sabroe Manufacturing Division in Arhus, Denmark.

"At a certain level, it is true Europe is not quite as technically fancy," he said.

At Sabroe, for example, the Unisys Corp. 2000/600 mainframe, which contains the materials requirements planning systems for scheduling work inside the factory, is not linked to the Apollo computer-aided design and manufacturing workstations.

"We have ideas [on how to link the two systems], but I'm always warning people that if you can't manage your factory today manually, you can't do it on computer," Rojel said.

Indeed, Americans impressed with Japanese technical sophistication would do well to remember that Japanese manufacturers first developed flawless paper-based systems, such as the index card-based "Kanban" used for tracking components around a factory floor, before converting them to computer code.

Ironically, the more limited notion of CIM was being talked about in the halls of the 11th-annual Autofact just as leading hardware and software vendors began to parade the technical tools to ease the integration of multivendor, multiapplication manufacturing environments.

How Telebit modems made some fast friends in the LAN industry.

Thanks to Telebit dial-up modems, out-of-building LAN communications have really picked up speed.

And Telebit has picked up a lot of new friends.

Friends like the nation's largest general contractor. Using Telebit modems and Banyan's *VINES*, it transmits payroll information from 35 remote offices to corporate headquarters. In half the time. And has eliminated the cost of leased lines.

Then, there's a national developer of communications software that uses Telebit modems and Novell's *NetWare AnyWare*. Throughput between its New York headquarters and remote offices for accounting, E-mail and order entry data has increased fourfold.

Plus a LAN VAR that uses Telebit modems and 3Com's *3+Mail*. Its E-mail connections are 5 times faster than before. And its phone and special delivery bills are lower.

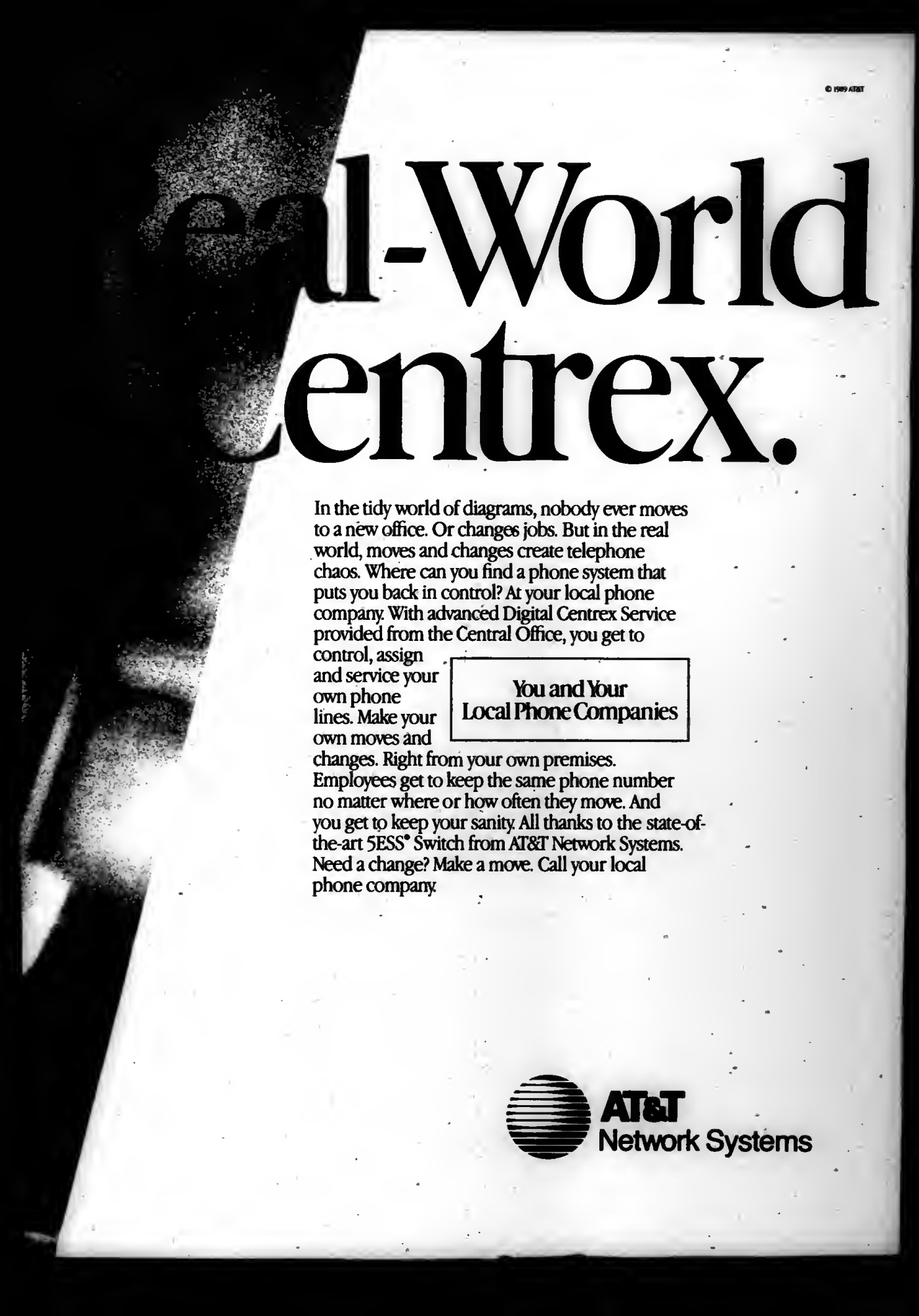
Imagine what Telebit modems will do for you.

If you have high-speed, dial-up WAN needs, we should get acquainted. So call today for your FREE application brochure: 1-800-TELEBIT or (415) 969-3800. Or write 1345 Shorebird Way, Mountain View, CA 94043.

Because no one gets the message through like Telebit.

© 1989, Telebit is a registered trademark of Telebit Corporation. Other product names are trademarks of their respective holders.

TELEBIT®
When connectivity counts



© 1989 AT&T

l-World Centrex.

In the tidy world of diagrams, nobody ever moves to a new office. Or changes jobs. But in the real world, moves and changes create telephone chaos. Where can you find a phone system that puts you back in control? At your local phone company. With advanced Digital Centrex Service provided from the Central Office, you get to control, assign and service your own phone lines. Make your own moves and changes. Right from your own premises. Employees get to keep the same phone number no matter where or how often they move. And you get to keep your sanity. All thanks to the state-of-the-art 5ESS® Switch from AT&T Network Systems. Need a change? Make a move. Call your local phone company.

You and Your Local Phone Companies

AT&T Network Systems

Horwitt

CONTINUED FROM PAGE 71

still the property of manufacturing and engineering executives, who tend to view IS with condescension at best; and often with antagonism. But keeping IS away from CIM projects tends to limit the concept to factory automation. Replacing people with computers and robots in effect automates existing processes without making them more effective.

I've noticed that, more recently, the networking side of CIM has been getting a lot of play, primarily from vendors who are trying to gain points from a new willingness to tie into other vendors' systems, in the interests of CIMful harmony.

Look at all the alliances that IBM, DEC and HP have made linking their hosts and CIM platforms with cell controller manufacturers and engineering workstation vendors. Look at IBM's recently announced CIM Architecture, which includes links to a variety of vendors' applications as well as support of MAP 3.0 across most major IBM systems. Look at DEC giving users the option of using either MAP 3.0 and token bus or Decnet and Ethernet, even while Decnet dominates the factory floor.

All of these comparatively recent developments make the networking side of CIM look less horrendous. But networking is just the foundation for CIM. The challenge involves coordination of data flow across various manufacturing areas, opening the way to benefits like inventory and quality control, faster implementation of change orders, elimination of the costs and inaccuracies of rekeying, and more efficient use of machine, human and materials resources.

Here is where IS should be brought into the CIM process. What's needed is a fruitful partnership that melds very different types of expertise.

A typically illuminating exchange between the two sides might go like this:

IS manager: "If you need real-time data collection, you'll have to buy a brand-new T1 multiplexer for a quarter of a million."

Manufacturing manager: "Are you kidding? We don't need real-time data collection. The forklift only stops here four times a day."

Fruitful dialogue between IS and manufacturing is unlikely to happen without outside help. The ideal third party would bring to the table experience in both the technical and business sides of CIM. It would either provide or recommend software tools that minimize the amount of code needed to implement a CIM system for a client's specific needs. And it would have consultants with background in your particular business, who could help set up a CIM game plan that focuses on practical business aims.

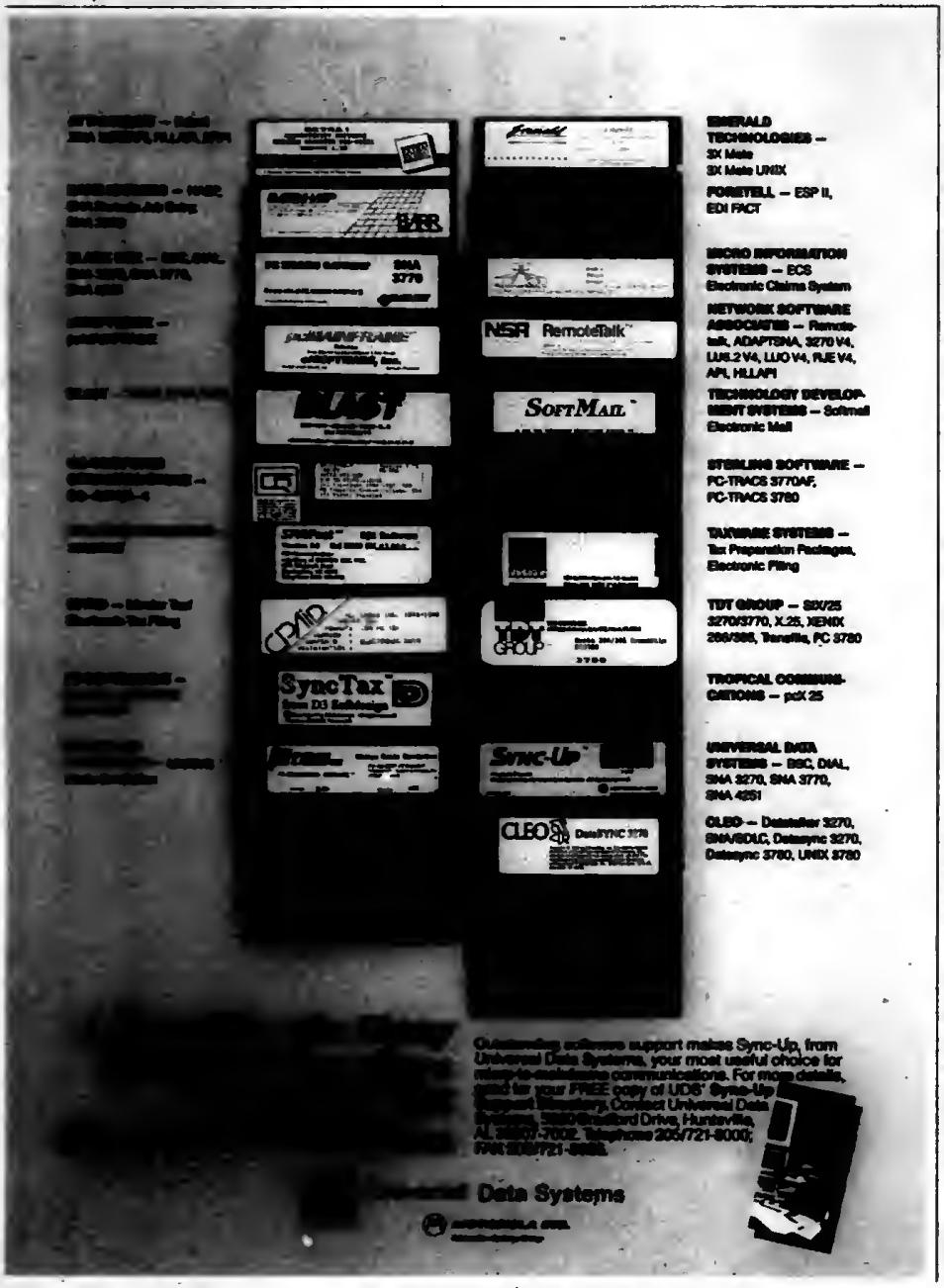
Manufacturers' realization that they need help on the business side of CIM has generated a growing market in plantwide systems integration. According to a recent study by Automation Research Corp., in Medfield, Mass., plantwide systems integration services for discrete industries will grow 24% from $1.7 billion in 1988 to $2.1 billion this year; and average 20% growth annually through 1993.

Some $306 million of the integration services purchased last year were from consulting firms, particularly the Big Six accounting firms. The big growth area in this industry is the computer companies like DEC, IBM, Prime and HP, whose market share will grow more than 32% annually, from $60 million in 1988 to $227 million in 1993, Automation Research predicted.

If you have already decided to base your CIM installation on a computer vendor's architecture, it may make sense to turn to that vendor for help when you integrate. But if you prefer a third party whose origins lie in the business consulting sector, with less built-in bias toward a particular hardware platform, you might consider one of the Big Six.

Whomever you choose, the idea is to anchor the CIM vision to the hard technical and business realities, rather than throwing money and automation at problems, hoping some of it will stick.

Horwitt is a *Computerworld* senior editor, networking.



BIT BLAST

X.400 on move for several firms

AT&T and Western Union Corp. announced last week that they have interconnected their respective electronic mail services via the International Standards Organization's X.400 protocols, giving their users the ability to exchange mail.

Both Tandem Computers, Inc. and Apple Computer, Inc. have licensed GSI-Danet, Inc.'s software package for testing of each of their future X.400 products' compliance with the CCITT standard.

Action Technologies, Inc. has hired **Touch Communications, Inc.** to provide X.400 support for Action's Message Handling System software.

The enhancement, scheduled for mid-1990 availability, will reportedly provide X.400 connections for a wide range of popular IBM Personal Computer applications that already support Action's software product.

NEW PRODUCTS

Local-area networking hardware

David Systems, Inc. has announced several twisted-pair Ethernet local-area network products.

The Expressnet product line has a modular design for integration and configuration flexibility, the vendor said, and the revised 12-port Expresanet Unshielded Twisted-Pair Ethernet Hub now includes full IEEE 802.3 10base-T and improved board-level diagnostics. It lists at $2,495.

Two Expressnet concentrators were also announced in five- or 12-slot configurations. They house up to four or 11 Expressnet twisted-pair hub modules, respectively, and one Expressnet Supervisor module. Each concentrator can support up to 48 or 132 users, respectively, and pricing is less than $200 per port for a 500-node network. The Expressnet Supervisor module integrates physical-layer network management of all hubs contained in the concentrator. Delivery is scheduled for the first quarter of 1990.

David Systems
701 E. Evelyn Ave.
Sunnyvale, Calif. 94086
408-720-8000

Equinox Systems, Inc. has unveiled a 12-port multiuser board for connecting high-speed terminals to AT&T Unix System V/Xenix-based multiuser personal computers.

According to the vendor, the Megaport-12 requires a slot in an IBM Personal Computer AT-compatible chassis and provides 12 asynchronous RS-232 ports. As many as eight boards may be installed into a PC, and customers can choose either DB-25, RJ-11 modular jacks or telephone-type punch block terminations. The board is priced at $1,295 and scheduled for availability this month.

Equinox
14260 S.W. 119 Ave.
Miami, Fla. 33186
305-255-3500

Local-area networking software

A network management software package for users of Autodesk's Autocad is now available from Nth Generation.

Christened CAD Manager, the document management system is said to be especially tailored for use with Autocad running on Novell, Inc. networks.

The software automatically spools Autocad drawing output to each user's default printer or plotter, and users may queue plots for off-line processing. A site license costs $1,195.

Nth Generation
124 Venice Ave.
Cincinnati, Ohio 45140
513-677-0842

CBIS, Inc. has announced a network operating system designed to support up to 255 users.

Network-OS version 6.3 utilizes a point-and-shoot installation program and is reported to be compatible with all IBM Personal Computer-compatible network software, as well as most Novell Netware-specific applications.

The cost of Network-OS ranges from $320 for two nodes to $2,550 for an 81-255 users license.

CBIS
5875 Peachtree Industrial Blvd.
Suite 170
Building 100
Norcross, Ga. 30092
404-446-1332

Alloy Computer Products, Inc. has introduced the latest version of its Microsoft Corp. DOS-based multiuser, multitasking system.

The 386/Multiware Version 1.1 reportedly permits users to connect as many as 20 personal computers or terminals to an 80386-based host PC. According to the company, each user can perform up to eight tasks simultaneously and share an assortment of peripherals.

A three-user system, which includes all the necessary components except CPU, terminals and cables, lists for $1,890.

Alloy
165 Forest St.
Marlboro, Mass. 01752
508-481-8500

Links

A multichannel protocol server is available from Able Computer Communications.

The Advance NPS/100 is reported to be an intelligent protocol gateway that allows Transmission Control Protocol/Internet Protocol terminal servers to transparently connect to Digital Equipment Corp. LAT hosts. The product provides 16 virtual circuits, each capable of supporting four distinct sessions. Priced at $5,300, the server is available 60 days from receipt of order.

Able Computer
2567A S.E. Main St.
Irvine, Calif. 92714
714-553-1188

Future Soft Engineering, Inc. has announced a Microsoft Corp. Windows-based communications and IBM 3278/3279 terminal emulation package.

Continued on page 86

TO MOST PROGRAMMERS, TEST IS A FOUR-LETTER WORD.

Everyone knows that software testing isn't a job that inspires kind words. In fact, even the most patient programmers and users have been known to spout strings of expletives when facing endless testing tedium.

But now you can clean up your act (and your testing) with TRAPS.® The revolutionary PC-based Testing/Recording And Playback System that increases testing productivity by up to 800%.

TRAPS automatically detects and captures mismatches in data, cursor positioning and attribute bytes – without the need for coding test scripts. With TRAPS, even the smallest discrepancies are identified and isolated – before they cause problems in production systems.

TRAPS breaks through the acceptance and regression testing barrier. As a development and maintenance tool TRAPS offers you a host of benefits in terms of time savings, quality assurance and productivity.

TRAPS. The Testing/Recording And Playback System you can swear by. Not at.

For more information or a demonstration of our completely automated acceptance and regression testing tool, call us at 1-203-277-9595 or 1-800-842-TRAP

TRAVTECH Inc.

One of The Travelers Companies,
One Tower Square,
Hartford, Connecticut 06183

TRAPS is a registered trademark of TRAVTECH, Inc.

Just a few of Dual

THE BEST MODEM FOR NETVIEW ISN'T FROM IBM.

When we announced the new DualView Management Option for 2600 Series modems, it made big news.

And the biggest news is, for the first time you can choose a modem for NetView based on capability instead of compatibility.

So if you need a leased-line modem for NetView at speeds up to 19.2 kbps, now you can get it with DualView. Along with an integral time division multiplexer, fully automatic dial back-up, and other exclusive features.

DUALVIEW MAKES NETVIEW WORK BETTER.

DualView expands NetView's modem management capabilities with 10 unique built-in features unavailable on IBM modems.

Plus DualView totally bypasses NetView/PC, so you can monitor your modem network directly from NetView.

© 1989 Codex Corp. Motorola and Ⓜ are trademarks of Motorola Inc. Codex and the Codex 2600 Series DualVIEW Management Option are registered trademarks of Codex Corp. IBM and NetView are trademarks of IBM

View's rave reviews.

AND EVERYTHING WORKS BEST WITH A CODEX 9800 NETWORK MANAGEMENT SYSTEM.

CALL US FOR A DUALVIEW PREVIEW AT 1-800-426-1212 EXT. 7235.

DualView does more than let your modems talk directly with NetView. It lets you talk simultaneously to a Codex Integrated Network Management System that does a lot of things NetView can't, like predict problems and help solve them, instead of just reacting to them.

What this all adds up to is the best of everything for you: NetView to manage your SNA environment, and Codex to manage your data communications network.

For more information about how DualView can make NetView more productive, call us at the number above.

codex
MOTOROLA

Continued from page 83

Dynacomm 3270 Synchronous Edition reportedly combines script language with the graphical user interface of Windows. The script language is said to include commands to provide high-level programming capabilities such as conditional execution and tabular data manipulation. The package offers pull-down menus, multiple overlapping windowing for multitasking and mouse support.

It runs on IBM Personal Computers, Personal System/2s or compatibles. The price is $295.

Future Soft Engineering
Suite 203
1001 S. Dairy Ashford
Houston, Texas 77077
713-496-9400

Meridian Data, Inc. has announced a family of compact disc/read-only memory (CD-ROM) networking systems that can simultaneously access up to 14 CD-ROM drives.

The CD Net series reportedly supports Novell, Inc.'s network software through the Novell IPX interface and can be hardware-configured to support Ethernet, Arcnet and Token-Ring networks. According to the company, the product connects to the local-area network like any other node and includes workstation management software that permits the user to selectively access any CD-ROM drive on the network.

Scheduled to ship this month, the product is priced from $5,995 to $16,545, depending on configuration.

Meridian Data
5615 Scotts Valley Drive
Scotts Valley, Calif. 95066
408-438-3100

Natural Microsystems Corp. has announced a personal computer-based product that integrates automated voice messaging, facsimile and communications capabilities.

Aimed at small businesses, the Watson Communications Center reportedly provides the user with voice mail, a 9.6K bit/sec. facsimile card and a 2,400 bit/sec. modem. Facsimiles can be transmitted directly to the computer screen or can be sent directly to any graphics-compatible printer, according to the vendor.

The PC can also function as an outbound communications device.

A complete package, including a scanner and mouse, is priced at $1,499.

Natural Microsystems
8 Erie Drive
Natick, Mass. 01760
508-655-0700

Gateways, bridges, routers

Digital Communications Associates, Inc. has announced a software addition to its Series 300 family of wide-area network processors.

Langate/IP reportedly gives users the ability to internetwork between Transmission Control Protocol/Internet Protocol (TCP/IP) and X.25 networks. The gateway software module also features a data compression capability and is priced at $4,995.

The firm has also introduced Lanserver/TCP, a terminal server that supports the TCP/IP networking protocol for Ethernet-based local-area networks; and SD Link, a Synchronous Data Link Control software module designed to support SNA/Synchronous Data Link Control communications over a Series 300 WAN. Lanserver/TCP costs $3,100, and SD Link carries a price of $795.

DCA
1000 Alderman Drive
Alpharetta, Ga. 30201
404-442-4521

Attachmate Corp. has revised its 3270 gateway software package to support modem-link speeds up to 64K bit/sec., the company said.

Release 1.3 of the Extra 3270 Gateway Option operates with Extra workstation software and reportedly utilizes the firm's recently announced Advanced Function SDLC Adapter to achieve increased speed performance. The product now permits data to multiplex with other data and voice over T1 links. The adapter incorporates an on-board coprocessor and memory, and an RS-232C connector and cable are included for direct connection capabilities.

The Extra Gateway Option allows as many as 128 Systems Network Architecture Logical Units to be active concurrently and is priced at $50. The Advanced Function SDLC Adapter lists for $1,195.

Attachmate
13231 S.E. 36th St.
Bellevue, Wash. 98006
206-644-4010

Cisco Systems, Inc. has added X.25 packet-switching capabilities to its line of internetwork routers.

Starting in October, the X.25 packet-switching technology will be included free of charge in all routers shipped with X.25 protocol software, the company said. The software reportedly provides three functions: it allows a router to function as a pure X.25 packet switch; it permits multiple switches of this type to be interconnected via Transmission Control Protocol/Internet Protocol; and eliminates the need for a parallel X.25 network by allowing the user's wide area network to transport standard IP traffic from both networked computers and X.25 devices.

The X.25 software is priced from $1,200.

Cisco Systems
1350 Willow Road
Menlo Park, Calif. 94025
415-326-1941

WHAT DO YOU CALL THE TOP DOG IN THE COMPUTER RENTAL BUSINESS?

Since 1962, you could always call Leasametric Data Communications, Inc. your company's best friend. You still can, but with an important difference. We've changed our name to Data Preference, which is much more descriptive of what we do. Because no matter what your preference in computer equipment for rent, lease, or purchase, Data Preference can create a complete package of products and services to meet your needs.

That's what makes us the top dog in the business—we have more personal computers, peripherals, and network products from more vendors, than anyone else. More finance plans to meet your budget. And more service programs to keep you up and running. So, give Data Preference a call, and find out what the top dog in computer rental can do for you.

Leasametric Data Communications, Inc. is now Data Preference.

Northwest (800) 343-7368, (415) 574-5797 • Southwest (800) 638-7854, (818) 708-2669
Central (800) 323-4823, (312) 595-2700 • Northeast (800) 221-0246, (201) 825-9000
Southeast (800) 241-5841, (404) 925-7980 • London: 011 44 923 897 000. © Leasametric, Inc. 1989

MANAGER'S JOURNAL

EXECUTIVE TRACK

Commodity Exchange, Inc. (Comex), the New York-based market for trading in metals futures and options, has announced two promotions in its operations and systems department.

Jack Sabo was named vice-president of application systems. He was previously senior director of application systems, a position he held since 1988. In his new position, Sabo is responsible for systems analysis and design of new advanced trade processing systems. He joined Comex in 1980 as manager of programming.

Before Comex, Sabo was controller of computer operations at Intercontinental Hotels Corp. He holds a master's degree in syllogistic logic from the Gregorian Institute in Rome, Italy.

.....

Barry Witt was promoted to vice-president of database systems in the Comex data center. He was previously director of database systems, a position he held since 1985.

Witt joined Comex as an independent consultant in 1983. Before Comex, he worked at The Dun & Bradstreet Corp. as a project manager and was later responsible for organizing and staffing the information center. He began his career at Mutual Insurance Rating Corp.

Witt holds master's and bachelor's degrees in business administration from Baruch School — City College of New York.

.....

Who's on the go?

Changing jobs? Promoting an assistant? Your peers want to know who is coming and going, and *Computerworld* wants to help by mentioning any IS job changes in Executive Track. When you have news about staff changes, be sure to drop a note and photo or have your public relations department write to Clinton Wilder, Senior Editor, Management, *Computerworld*, Box 9171, 375 Cochituate Road, Framingham, Mass. 01701-9171.

An unvarnished view of IS efficacy

MIT's Thurow takes aim at the lack of payoff from computerized office

The Dean of MIT's Sloan School of Management and an economist with outspoken views on the lack of U.S. economic competitiveness, Lester C. Thurow brings an uncommon perspective to information systems management. Thurow sees computers being applied to outdated procedures and generating unnecessary information, and he notes the lack of a bottom-line orientation on the part of IS managers. Computerworld *Senior Writer David Ludlum recently spoke with Thurow about the role of IS and the individual manager.*

DAVID LUDLUM

MIT's Thurow: "Only in the abstract do we love to change."

As an economist, do you see any trends underlying the current difficulties in the computer industry?

One of the problems you've got is that every market eventually becomes satiated.

Point two is that computerizing the office just hasn't paid off in terms of bottom-line productivity. For it to do so, you would expect to see white-collar employment growing more slowly than output. In fact, the number of white-collar employees has grown much faster than output, which means we have fallen in productivity among white-collar workers at the same time we're putting all this investment into computerizing the office.

It's trite to say it, but it really is true: To computerize the office, you have to reinvent the office in terms of who reports to whom, what reports are generated — all those kinds of things. But ripping up the office and inventing a new office is sociologically very difficult because you interfere with power arrangements, and you interfere with established customs and procedures.

Could this just be a transitional phase?

Maybe, but it's been a long time. And the interesting thing is that neither the Japanese nor the Europeans have computerized anywhere near as fast as we have, yet their office productivity and service productivity are rising much faster than ours is. So if you just looked at the objective data, you'd say using computers is a mistake. Now, I don't think it is a mistake because you can see these amazing things that people can do, but if you just do amazing new things and end up layering the system like we've done, if you were making a hard-nosed business decision I think you wouldn't have invested in as many.

What are the repercussions for IS organizations?

A lot of frustration, because the CEO

Continued on page 90

GAO Hall of Shame cites techno-lemons

BY MITCH BETTS
CW STAFF

Most of the talk at the Federal Computer Conference in Washington, D.C., last month was about the wonders of technology.

But, as usual, the U.S. General Accounting Office (GAO) put a stop to that.

The GAO is the congressional watchdog agency known for its harsh critiques of federal information systems. For many agency executives, undergoing a GAO audit is on par with getting a root canal.

A conference presentation by Rona B. Stillman, chief scientist at the GAO's Information Management Technology Division, scolded federal IS executives for worshipping technology as the center of the world and viewing the agency and its mission as merely a "convenient context for developing technology."

Stillman emphasized that technology only exists to support the agency's mission and "has absolutely no intrinsic value otherwise." Typically, IS departments upgrade their systems without ever considering whether it helps the agency accomplish its mission better, not just faster.

Then, she got tough. Stillman cited three general examples from what she called the GAO Hall of Shame:

- An agency planned to upgrade systems to keep up with the work load, but customers said that most of the generated reports were useless and thrown in the trash. "What we see is not a system that is too small to process the work load. We see a work load that hasn't been analyzed and much of which doesn't have to be done at all," Stillman said.
- Some officials upgrade centralized operations without considering any other options. "[One agency] spent a great deal of money to replace the big old message center with a big new message center. They never considered the concept of eliminating the message center" and using electronic mail for direct transmissions instead, she said.
- Many agencies have exciting strategic plans for providing better services, but their technology plans bear no relationship whatsoever to the strategic goals of the agencies. "All we see in the technology plans are plans to buy new stuff to do the same wrong thing faster," Stillman explained.

InseparaBull

KNOW BULL

"UNIX is a registered trademark of AT&T. / ORACLE is a registered trademark of Oracle Corporation. / INFORMIX is a registered trademark of Informix Software, Inc. / Unisys is a registered trademark of Unisys Integration Systems, Inc. / WordPerfect is a registered trademark of WordPerfect Corporation. Copyright © Bull HN Information Systems Inc., 1989

Bull has been with UNIX* operating systems from the beginning. As a charter sponsor of X-Open and an active participant in OSF, we're proud to introduce a brand new line of UNIX multi-user systems to our portfolio of proven UNIX solutions.

Now the Bull DPX/2 is ready to take UNIX operating systems into the future starting with the applications of today, including ORACLE, WordPerfect, Uniplex and INFORMIX.

Even our existing GCOS 6 customers can tap the enormous advantages of the new open systems technology with our new peer processor. It can open you up to UNIX systems solutions.

Either way, you'll find the networking expertise and the worldwide product service and resources of a $5 billion global giant behind you from the beginning.

Know Bull.

For a copy of "The Bull DPX/2 Systems, Reflecting the Needs of Today's Business," call 1-800-233-BULL, x 130.

Bull

Thurow

FROM PAGE 87

says to the CIO, "I've given you a lot of money; why isn't it paying off?"

Does that have something to do with the rate at which CIOs and VPs of information systems seem to come and go at firms?

That reflects two things. It reflects frustration with the lack of payoff, but it's also probably like the chief of human resources development — it's a little bit of a dead-end job. Because if you look at who becomes CEO, there are certain second-level jobs that never lead you to the first-level job. People regard the job of chief information officer as too specialized a set of experiences to qualify you to actually run the company.

I think there's probably frustration on the part of those people too, because they get up to a certain level and they can't be promoted.

Information systems are playing an increasing role in corporations. Do you think that will change things — that CIOs will become more eligible for the top job?

I would suspect not. You don't get a chance to get to the top unless you've actually done some line management. Information systems is a staff function. You can make an argument that we've already got too many [top executives] coming out of staff functions.

So your view of the CIO's prospects isn't particularly positive.

Getting up to the second level of the company is a good career. Most people don't make it that far. If you could really make the whole thing pay off in terms of productivity, I suspect whoever does that is going to find it opens up lots of avenues — higher jobs than director of information services or VP of information services.

Do you have any thoughts on how someone might pursue that direction?

It really requires structural changes in the way we do things. The problem with information services is that it's so easy to generate data on things. Each bit of data is so cheap that we tend to generate millions of bits, and then it ends up being horribly expensive.

Thinking seriously about what we need and what we don't need — with the emphasis on what we don't need — is the way to go, because clearly you can do remarkable things with this technology; the question is how to keep it from burning up resources when it isn't doing remarkable things.

Do you see significant changes in the way information technology is going to be used by U.S. businesses as we move into the 21st century?

The way it is used is going to have to change. The investments are just too large to let them sit there in a nonproductive way. It isn't at all clear at the moment how they're going to change, but the fact that they will change I think is 100% assured, because sooner or later frustration leads to action.

Can you give an example?

Take banks. It's hard to believe, but if you look at the statistics, it would seem that processing checks by hand is just as efficient as processing checks by computer. The reason is that we won't go all the way and do electronic banking, where you give up checks.

The problem with checks is that somebody has to hand-read every check to verify the amount that the check is written for. That completely vitiates the computer system. The Europeans are shifting to electronic banking, where you just have a card. Then you can make your computer system in banking pay off.

The problem in the U.S. is twofold. One, the merchants don't want to buy the equipment to do electronic banking.

Two, individuals are reluctant to give up checks and have instant debits. The second thing can be solved if the banks agree not to deduct it for three days. But of course part of the produc-

© Eastman Kodak Company, 1989

The KODAK Optical Disk System 6800... for people with a lot to store, and not much time to process it. The system has the highest capacity and the highest transfer and access rates.

If your business needs to store and retrieve significant amounts of image-intensive or alphanumeric data, specify the KODAK Optical Disk System 6800.

It offers unparalleled storage capacity, flexibility and speed, in the smallest footprint per megabyte available today. The KODAK Automated Disk Library can put you on-line to over one terabyte—that's 1000 gigabytes —of stored data in just 6.5 seconds. Available in several configurations, the library requires as little as 13 square feet of floor space.

Additionally, the KODAK Optical Storage Interface can connect the system to a wide range of minicomputers or IBM® mainframe host environments.

For a complete package of information, call 1 800 445-6325, Ext. 993A. Visit us at Comdex Booth 2716.

We're looking for systems integrators.

SO MUCH DATA, SO LITTLE TIME. CALL KODAK

tivity, as far as the banks are concerned, is that you can deduct it instantly.

It's not that it's physically impossible to make it pay off, but it means you have to change habits.

Banks aren't used to the idea that they have to buy equipment to put in the local department store. But that's the place to put equipment that will make the banks more efficient.

You've noted that the Europeans have bought fewer computers than Americans and their office productivity is growing faster. Have they pursued a course that is more appropriate?

Not by choice. They probably were just laggards, but being a laggard proved to be the thing to be, which is often the case. Innovators don't always win, because they make a lot of mistakes and incur a lot of expenses. If you wait, you can see the right way to do it and not incur all of the expenses of making these mistakes.

How would you size up the situation in Japan?

If you looked at usage, you wouldn't say they're pioneers. They've in some sense been laggards. What contributed to Japanese productivity in the last decade has not come out of computer technology, so I don't think you would say the Japanese have been big leaders in getting productivity out of computer systems.

Has that been a conscious direction?

No, I think it's just flowed out of the fact that because of the Japanese language, they had many fewer computers around. You can't really do Japanese word processing. It is possible, but it's very slow. And so this huge purchasing of computers for word processing hasn't occurred.

You said it isn't clear how we can reinvent the office, but are there steps someone might take toward doing so?

Part of applying computers is knowing when not to use them. For example, take inventory control. It is possible to design a very sophisticated computerized inventory control system. But we know it's damned inefficient. The efficient way to do inventory control is to do just-in-time inventory, so that the workers on the line do it, and you don't have computer systems at all. [Just-in-time inventory] requires bosses who are willing to trust their workers to do a good job, because the bosses will not know what the inventory situation is.

I think Americans think that more information is always better than less information. And since information costs money to get, it isn't true. My impression is that most universities and most companies carry enormous amounts of information that has no positive value whatsoever. They more or less keep records for the sake of keeping records just in case they might need them.

> THE REST OF THE world will let you automate what they're doing, but they won't let you change what they're doing.
>
> LESTER THUROW
> MIT'S SLOAN SCHOOL

Can you point to other examples of computers being used ineffectively, perhaps in finance or marketing?

Double-entry bookkeeping. With the advent of computers, many companies close their books every night. What the hell do you learn by closing your books every night?

Anything similar in the marketing area?

Well, I worry about supermarkets. With these electronic checkouts, the stores are generating huge amounts of information. The idea is that all this information can be used to create better sales and marketing. The question is, how much of it will be? I don't know, but I'm skeptical every time I walk through a checkout.

So, for starters, we have an information management problem.

We certainly have that. But it is a lot more than information management. If you change information, you change power relationships and sociology inside a firm. If you change information flow, you change who reports to whom.

So, I think part of the problem is that an information officer would have to have a lot more clout to reorganize the firm than they do in fact have. To make information technology pay off, you're going to have to involve a lot of people other than information systems people. The rest of the world will let you automate what they're doing, but they won't let you change what they're doing.

In order to make it efficient, you have to change what they're doing.

Does the chief information officer have that kind of clout?

No. He never has that kind of clout. Not even the CEO has that clout. I mean the CEO technically has that kind of clout, but [not if] you get revolt in the ranks and the revolt is so extreme that it is disturbing the system.

It sounds like that might involve issues that prospective information systems professionals would not explore in school.

Most people who are students don't realize how difficult it is to change those relationships. It's partly because human beings lie. We say we love to change; in fact we refuse to change. Only in the abstract do we love to change.

L=!Ûi▪' v♦♦| â¬ P♦/=â¬ª╤zP♦ê▒â¬ P♦
â)¬ u♦╞♦L ♦╡(♦▒P♦ G♦]Cá▒ó ▪ ö:½╕
]╞Ûi▪♦.C♦Wr v♦♦I â-â)| t;â)| tâ)ñ u
▒u╞£♦:i♦]╞Ûi▪i^♦Ç♦ ui╕▪PS♦Hzâ-♦ └uƵ
iW ú4½ë6½╕0 Pi╞♦♦ P♦ yâ-♦ └╞♦ñ ♦

Your Spreadsheet Can't Read It Either.

Now, you can translate mainframe and microcomputer report information directly into PC spreadsheets and databases with AutoImport™ The "must" utility for any PC user who analyzes and uses corporate data resident in other systems.

AutoImport—from the creators of the award-winning file transfer utility, The Brooklyn Bridge.™ See your dealer or call (800) 344-6783.

Come visit us at Booth #B-1944 at the COMDEX show for a personal demo.

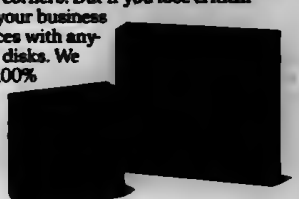
AutoImport

The Brooklyn Bridge is a trademark of Fifth Generation Systems, Inc.

"Why pay more for a climbing rope? If it breaks, we'll give you a new one free."

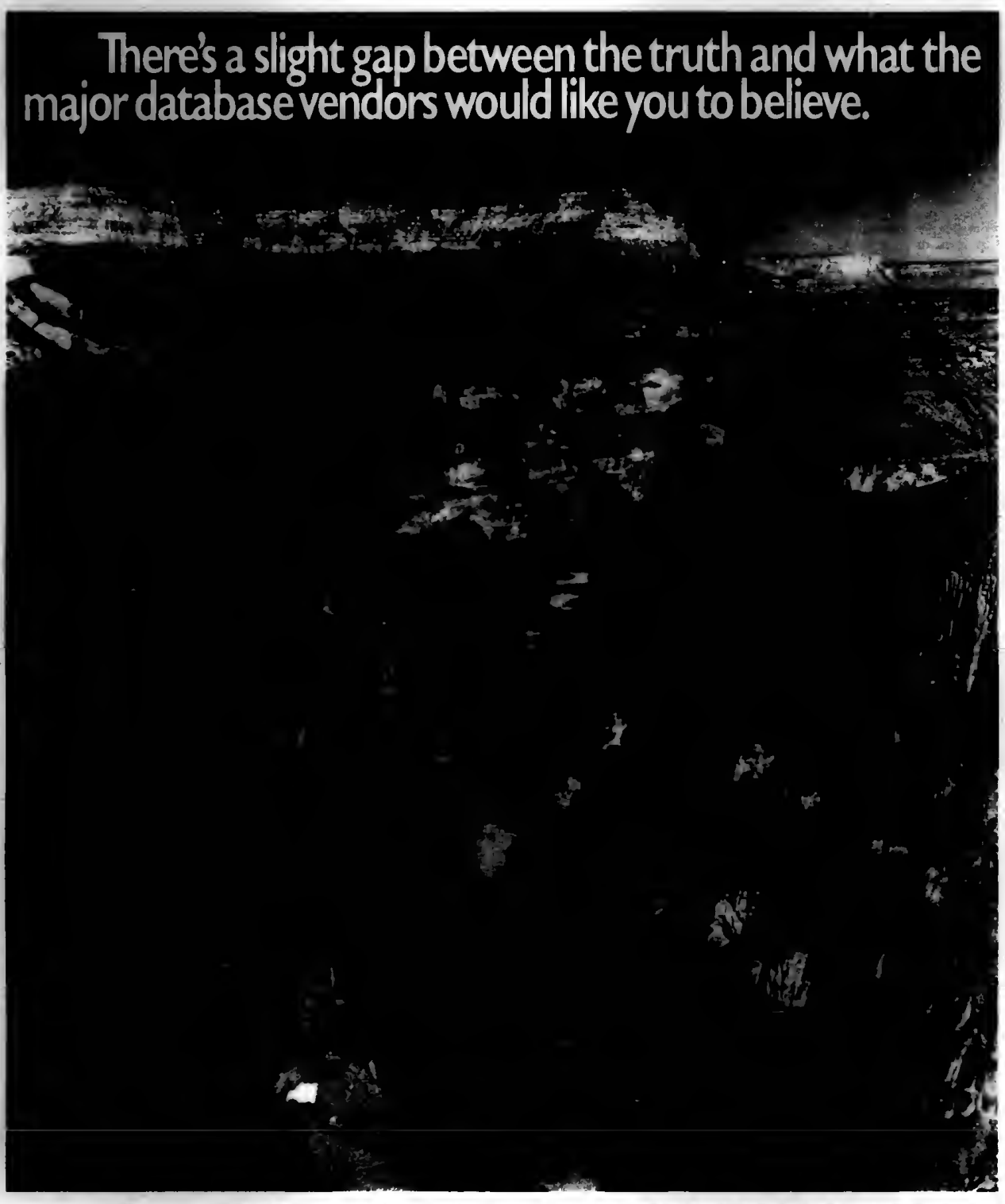
It's easy to cut costs by cutting corners. But if you lose critical data, it's gone for good. When it's your business that's on the line, don't take chances with anything less than Dysan 100 flexible disks. We test 100% of our disks and certify 100% to be 100% error free over 100% of the disk surface.

The Dysan 100. It's not just a name. It's a measure of superiority.



Dysan·100
100% Better

There's a slight gap between the truth and what the major database vendors would like you to believe.



Even a minor "discrepancy" in a database vendor's promises can wind up stopping you dead in your tracks. Because when a product can't live up to its claims, you've got an unbridgeable problem.

Consider this, then. They say that their databases are "distributed." But can they store data everywhere in your mixed-platform network—and read and update from any node? Interbase can. They say they're fast. But do they achieve performance beyond elementary TPI benchmarks? Interbase does. They say they're right for the times. But were they designed for the complex database networks of the '90s? Interbase is.

At Interbase, we're not interested in misleading you. We're interested in your application working the way you thought it would.

No surprises. No gaps.

Interbase Software Corp., Bedford, MA. Please phone us toll-free at 800-245-7367.

INTERBASE

It's simple. We handle the complex.

Status quo must go, MIT's Treacy says

BY MARYFRAN JOHNSON
CW STAFF

BOSTON — Michael E. Treacy bears no glad tidings for the status quo at corporate headquarters.

Got millions upon millions invested in current computer systems? Prepare to trash it all, the information systems consultant and MIT professor told a recent gathering of John Hancock Insurance Co. managers.

"What we have now won't get us to where we want to be in the mid-1990s," Treacy said of Hancock's 30-year investment in systems and applications. "The key is a fundamental shift in thinking about how to be successful with technology."

Treacy was the star attraction at Hancock's fourth annual Technology Awareness Event on Oct. 31 and Nov. 1, which filled the company concourse with exhibits from vendors displaying workplace technology both present and future. Some 800 company executives, managers and employees attended.

Along with Treacy's unsettling message, his very appearance at the Hancock meeting bore just a touch of radical chic. He wore a vivid green and black striped bowtie that drew the eye away from his sober business suit.

Treacy's background includes a doctorate in MIS from MIT's Sloan School of Management, consulting work with Index Group, Inc. in Cambridge, Mass., and the recent establishment of his own Cambridge-based firm, Treacy and Associates.

At a breakfast meeting with 70 top business managers at Hancock, and later in meetings with the company's IS staff, the consultant hammered home the message that the most successful companies will be those whose high-tech investment is driven by business managers — not IS professionals.

Treacy *foresees major damage.*

Yet, Treacy stressed, IS retains a crucial role as well. Directing the shift in corporate thinking about technology may come from "IS professionals transitioning into a business role, bringing a fresh and very different perpective," he said.

"Don't make the mistake of thinking you're moving ahead just fine," he said. "Incremental innovation is a disaster. It allows us to think we're doing good while we're dying slowly."

Companies should plan to spend 10% to 20% of new dollars on research and development in systems applications, he said.

The next five to eight years will be a watershed period for many companies, whose survival will depend on using technology to create enterprising ways of operating the business. "Major damage" will be done, Treacy noted, by upstart firms and savvy competitors willing to break rules and innovate more quickly.

At Hancock, for example, the Filenet Image Processing system from Wang Laboratories, Inc. is in use in the group pensions department for claims processing and retirement benefits.

"Imaging is eventually going to become a major form for paper-intensive industries like this one," Treacy said. "But there is no advantage to automating existing business processes with it. The key is finding applications for it that transform the business."

Organizations that have faced up to the issue of their survival can be "incredibly innovative" in changing their business culture, he said, pointing to Xerox Corp. as an example. He noted how Xerox "revolutionized" its own methods of designing and manufacturing copiers when competition from Canon came snapping at its heels.

Companywide integration and systems coordination is another key to improving customer service and guaranteeing success, he said. Cincinnati-based Procter & Gamble, Inc., he noted, pulled together under the umbrella of "product delivery" three formerly separate functions covering suppliers, manufacturers and finished-goods delivery.

"Fundamental innovation is revolutionary. You've got to be willing to throw stuff away. It's very very painful," he said, suggesting that Hancock will "systematically throw away" $1 billion in technology over the next decade.

"Most IS people have a good sense of what needs to be done," he said. "I just confirm their thinking."

A 5-step plan for IS execs

To jump start your management executives and more quickly drive information technology innovations into practical use, consultant and MIT professor Michael Treacy offers a five-point plan for information systems executives to follow:

- Present management with a strong case for action backed up with a solid business plan, financing and strategic analysis.
- Secure and sustain intensive top-down pressure from the chief executive officer, but let midlevel managers work out the specifics.
- Provide opportunities for bottom-up involvement, giving employees a sense of ownership in the plan. Run the plan as if it were a political campaign, with a sustained, consistent message.
- Set up milestones by which to measure progress and fuel a sense of urgency. Plan to show concrete results within three years.
- Determine to remove all of the laggards and the naysayers of the plan.

MARYFRAN JOHNSON

CALENDAR

"The Personal Computer Outlook" will explore the coming decade of personal computers and industry issues when it is held Dec. 4 and 5 in San Francisco.

The conference, co-sponsored by Technologic Partners and Merrill Lynch & Co., will feature speakers Jim Manzi, chairman of Lotus Development Corp.; Steve Jobs, president of Next Computer; James Cannavino, president of entry systems at IBM; Scott McNealy, chairman, president and chief executive officer of Sun Microsystems, Inc.; John V. Roach, chairman, president and CEO of Tandy Corp.; Robert M. Kavner, president of the data systems group at AT&T Information Systems; Rod Canion, president and CEO of Compaq Computer Corp; Jon Shirley, president and chief operating officer of Microsoft Corp.; and David L. House, senior vice-president and general manager of the microcomputer components group at Intel Corp.

For more information, contact the conference coordinator at Technologic Partners, Suite 500, 419 Park Ave. South, New York, N.Y. 10016.

NOV 20-26

Illicit Code: Protection and Recovery. Jericho, N.Y., Nov. 21 — Contact: Roberta Gemmder, Data Processing Management Association, Long Island Chapter, P.O. Box 370, Hicksville, N.Y. 11601.

NOV 27-DEC 3

When Should You Consider Optical Disks? Detroit, Nov. 27-28 — Contact: Pat Paletta, Optical Disk Institute, P.O. Box 289, Newton, Mass. 02160.

Configuration Management Seminar. Seattle, Nov. 28-30 — Contact: University of Washington Extension, 5001 25th Ave. N.E., GH-24, Seattle, Wash., 98195.

Engineering Workstation Conference. Los Angeles, Nov. 28-30 — Contact: EWC, P.O. Box 3275, Santa Monica, Calif. 90403.

InForce '89, Practical Perspectives on Computer and Networking Security. Mountain View, Calif., Nov. 28-30 — Contact: Advanced Computing Environments, Suite 100, 480 San Antonio Road, Mountain View, Calif. 94040.

Principles of Retailing for Nonretailing Executives. New York, Nov. 28-29 — Contact: National Retail Merchants Association, Conference Registrar, 100 W. 31st St., New York, N.Y. 10001.

OSI Product Integration Conference. Washington, D.C., Nov. 28-Dec. 1 — Contact: Conference Manager, Suite 221, U.S. Professional Development Institute, 1734 Elton Road, Silver Spring, Md. 20903.

Cause '89. San Diego, Nov. 28-Dec. 1 — Contact: The Association for the Management of Information Technology in Higher Education, Suite 302E, 4840 Pearl E. Circle, Boulder, Colo. 80301.

Achieving Lights-Out Data Centers Conference. Washington, D.C., Nov. 29-30 — Contact: Nelson Moskowitz, Manufacturing Institute, 23rd Floor, 437 Madison Ave., New York, N.Y. 10022.

"Scuba tanks are all alike. Buy the cheapest one you can find."

Not all floppy disks are alike. If you can't take chances with your data, don't take chances with anything less than a Dysan 100. We test 100% of our disks and certify 100% to be 100% error free over 100% of the disk surface.

The Dysan 100. It's not just a name. It's a measure of superiority.

Dysan 100
100% Better

International Data Corporation
Presents

December 7, 1989

Santa Clara Marriott
Santa Clara, CA

Attend IDC's Graphics & Image: **The Next Revolution** for a bottom-line oriented analysis of the products and strategies that will drive the use of image and graphics in the applications of the '90s. IDC's technology experts will answer questions of how to manage the technologies/products, when to implement them, and who has the steak versus who has the sizzle. The primary focus of the sessions will be oriented toward customers and their issues in this new field.

THE PROGRAM

Graphics & Image -- An Information Revolution
Aaron C. Goldberg, Vice President, Workstation Research, IDC
PC Hardware and Applications for Graphics
Joan-Carol Brigham, Program Director, PC Graphics and Expansion Products, IDC
The Role of Graphic User Interfaces
Nancy McSharry, Program Manager, PC Software, IDC
Image and the Office System
Ann Palermo, Program Director, Integrated Office Systems, IDC
The Role of the Macintosh
Abigail Christopher, Program Manger, Macintosh Market, IDC
Low End Displays
Eileen O'Brien, Program Manager, Terminals, IDC
Image Storage
Jay Bretzman, Senior Analyst, Storage, IDC
Outlook for Image
TBA, Program Director, Image Systems, IDC

International Data Corporation
5 Speen Street
Framingham, MA 01701

YOU WILL LEARN

- How far along your colleagues are in adopting and using graphics hardware and software products.
- How soon, and why, they plan to upgrade to higher resolution and/or color.
- Where image applications are most effective.
- Key supplier's product strategies.
- How far presentation graphics software and desktop publishing software have penetrated the PC user community.
- Cost-saving alternatives to a PC on every desk.
- Which graphic and image appliacations provide the best return on investment.

WHO WILL ATTEND

Office Automation Managers, Information Center Managers, Application Development staff, and those responsible for their organization's graphic & image strategies.

Vendors interested in thier clients' wants and needs, and their competition's answers.

REGISTER EARLY!

Attendance is limited and this session is expected to fill quickly. To avoid disappointment, reserve your place today. Contact Kathy Collins at (800) 343-4952, extension 4258. In Massachusetts call (508) 935-4258. Registration Fee - $595.

BOOK REVIEW

The anxieties within today's onslaught of modern information

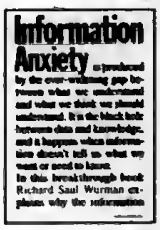
INFORMATION ANXIETY
By Richard Saul Wurman
Doubleday, $19.95

In the movie *Dead Poets Society*, the preparatory school teacher played by Robin Williams shocks his students by standing on top of his desk and exhorting them to do the same. His lesson is simple: It is time to step outside your traditional perspective and look at the world in a new way.

As U.S. businesses approach the challenges of the 1990s, that lesson is a critical one for IS executives and their general business counterparts. Richard Saul Wurman's unusual and thought-provoking book *Information Anxiety* is a very good tool to help achieve that kind of new perspective on the phenomenon that drives our economy and our society: information.

What *is* information? How is it conveyed among individuals, passed on by teachers, shared among business executives, absorbed by newspaper readers or television viewers? And why do so many of those information exchanges fall short of their goal of bridging the gap between information and understanding? These are among the questions that Wurman places on the table for his readers to ponder.

Originally trained as an architect and designer, Wurman has more recently written several books that redesign reference sources — Yellow Pages, travel guidebooks, maps — to present their traditional information in more accessible form. Opening *Information Anxiety* with the statement that "books are a major source of information anxiety," Wurman proceeds to reconfigure the conventional parameters of book writing and — even more importantly — book reading.



He encourages readers not to proceed sequentially from beginning to end, but to browse, enjoy and absorb. He combines the unconventional format with unconventional insights.

The initial premise contained in Wurman's title is not a particularly new one — that the daily barrage of information, which most people face, is often more of a curse than a blessing. A single weekday edition of *The New York Times*, he points out, contains more information than a typical 17th century Englishman was likely to encounter in a *lifetime*.

Much of all this extra information is less than user-friendly, however, creating the condition of anxiety. You know the information is available, but you find it very difficult to get at it in a way that is easy to comprehend.

In a breezy and conversational style spiced with humor to drive points home, he dissects virtually every vehicle of information you can think of — instruction manuals, conversations, television news, *USA Today* color graphics, corporate memos. An added bonus is the margin of every page, which Wurman annotates with relevant facts, anecdotes and quotes. You'll find expected sources like Alvin Toffler or Marshall McLuhan alongside Epictetus, Marcel Proust or Tom Robbins.

Wurman is particularly on target in a chapter on the topic that should be foremost in the minds of anyone who cares about the future of U.S. business and society: education. He argues that our current system encourages students to fear rather than embrace learning — to regard it as something like cod-liver oil, "something that might taste pretty bad but may do some good in the long run." The educational system ultimately produces information anxiety because it causes students to feel intimidated by what they do not understand.

Wurman advocates less teaching of facts and more training in how to deal with information by questioning, thinking and not fearing failure — a lesson that U.S. businesses should also heed.

If you perceive that your primary job is to keep computers running, you will not find *Information Anxiety* very relevant to your work. However, if your job involves managing the form, delivery and destinations of information within your organization, this book should provide valuable new insight into how to do that better. It is orders-of-magnitudes more fun than a technical manual on database design — and arguably much more relevant to the real mission of the IS executive.

CLINTON WILDER

Wilder is *Computerworld*'s senior editor, management.

Premier 100 winners feted at awards dinner

MCI takes top prize for excellence in information systems use among various industries

If the *Computerworld* criteria for rating the effective use of information systems could sing, their tune in 1989 would ring out, "I like my MCI."

The spotlight was turned on MCI Communications Corp., ranked No. 1 in the second annual *Computerworld Premier 100*, at a recent awards dinner in New York honoring the most effective users of IS. And one executive who never shies from the spotlight, colorful MCI Chairman William G. McGowan, was on hand to accept the first-place award.

McGowan was accompanied at the presentation by two IS executives, Senior Vice-President Allan Ditchfield and Executive Vice-President Dick Liebhaber.

Presenting the awards were Patrick J. McGovern, chairman of International Data Group, as well as *Computerworld* Publisher Fritz Landmann, Editor-in-Chief Bill Laberis and Senior Editor Michael Sullivan-Trainor.

IS executives present to receive the awards were Dennis Murphy, director of GTE Corp., which was ranked No. 2; Thomas Kiernan, president of the Sabre Computer Services division of AMR Corp., No. 3; Carmine Vona, executive vice-president of Bankers Trust, No. 4; and Ron Cybyshe, senior vice-president of Banc One Corp., No. 5.

Also on hand to accept awards were Ken Wang, director of General Dynamics Corp., which earned a No. 6 ranking; Johanna Peters, a vice-president at the New York office of Security Pacific Corp., No. 7; Michael S. Heschel, corporate vice-president of Baxter Healthcare Corp., No. 8; and Herbert W. Moller, vice-president, and Ted Standish, director, of Gillette Corp., No. 10. Contel Corp. was ranked No. 9.

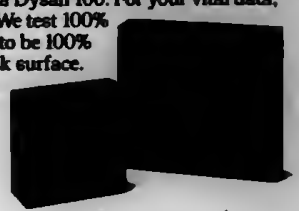
Following the presentation of the awards, keynote speaker Lester Thurow, dean of MIT's Sloan School of Management, warned of serious consequences for the U.S.' economic position if the nation fails to solve its education crisis.

Computerworld Premier 100 *award winners gather. MCI Corp. Chairman William G. McGowan, center, represented his top-ranked firm*

"A parachute's a parachute. Here's one that will save you big money."

A disk is a disk. Unless it's a Dysan 100. For your vital data, don't settle for anything less. We test 100% of our disks and certify 100% to be 100% error free over 100% of the disk surface.

The Dysan 100. It's not just a name. It's a measure of superiority.



Dysan 100
100% Better

OPEN vs.

SUN

No commercial-grade file system

No system under $700/MIPS

No POSIX compliance

No symmetric multiprocessing

DEC

No open I/O bus across product line

No symmetric multiprocessing currently available

No multi-vendor binary compatibility

No system under $700/MIPS

IBM

No open architecture

No multi-vendor binary compatibility

No POSIX compliance

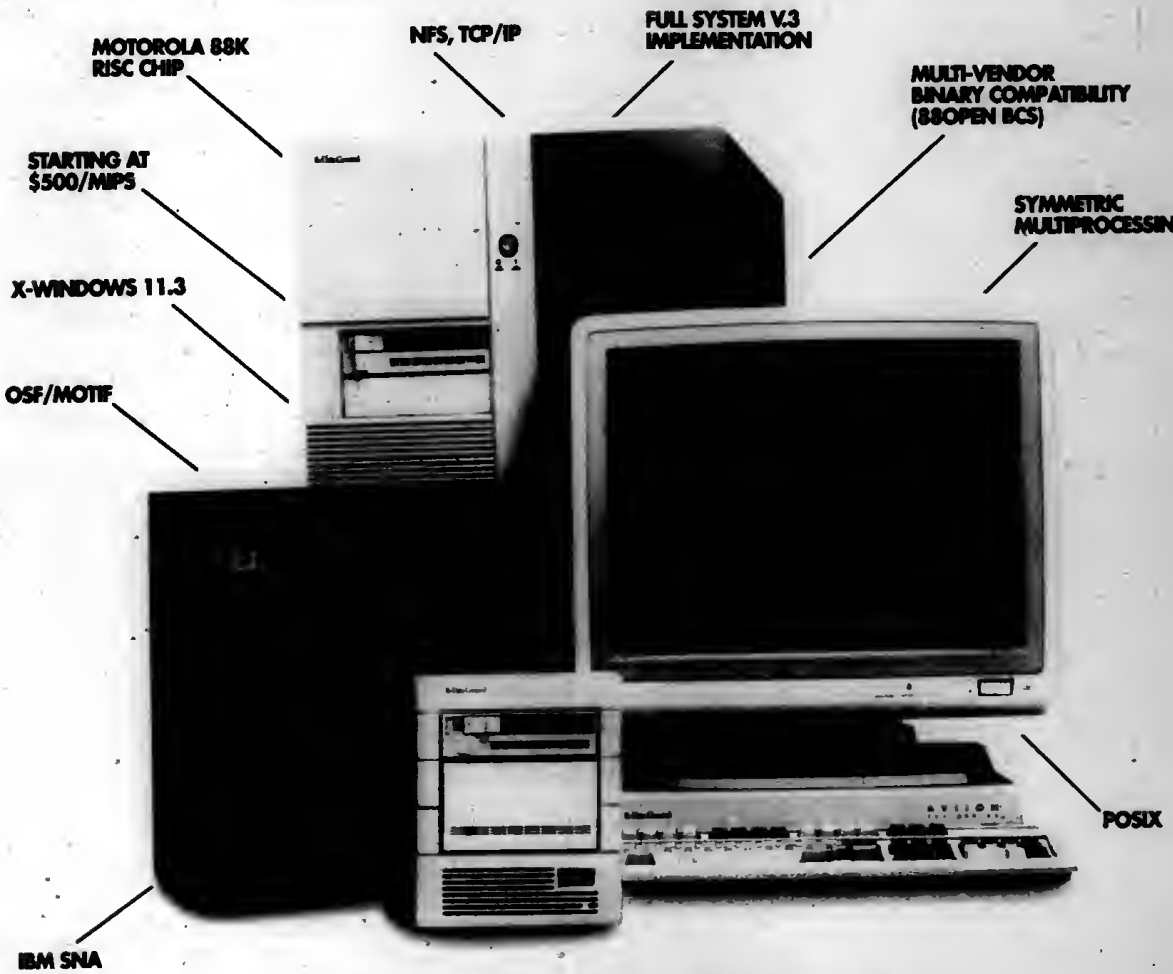
No system under $2500/MIPS

No symmetric multiprocessing

The above comparative product data is based on industry resolutions, industry analyst information, vendor price lists, vendor advertising material, and other material available as of September 7, 1989. For a listing of information sources, please write Advertising, M.S. 9/8, Data General Corporation, 3400 Computer Drive, Westboro, MA 01580.

AVION and DG/UX are trademarks of Data General.
UNIX is a registered trademark of AT&T.
OSF/Motif is a trademark of the Open Software Foundation.
NFS is a trademark of Sun Microsystems.
©1989 Data General Corporation.

WIDE OPEN



Data General's new AViiON Family.

While others claim their UNIX-based RISC platforms are "open," only Data General's AViiON™ Family is truly open. Wide Open. To the UNIX® standards, the networking standards, the graphical user interface standards. We support the 88open BCS, the industry's only binary standard for multi-vendor interoperability. System V.3, Berkeley, POSIX, ANSI C, NFS™, TCP/IP, IBM SNA, X-Windows, OSF Motif™, VME and more. So your AViiON system will be open to whatever you choose.

And you have a growing family to choose from, starting as low as $500/MIPS: workstations, servers, rack-mount and multi-user systems. All with the advanced commercial-grade features of DG/UX™.

But don't take our word for it. Call 1-800-DATAGEN today and we'll send you a free copy of "What the Experts say about Data General's UNIX-based RISC Family." Or write to:

Data General
3400 Computer Drive, Westboro, MA 01580

FOR YOUR FREE "WHAT THE EXPERTS SAY" BOOKLET, CALL 1-800-DATAGEN.

SEE US AT COMDEX, BOOTH #26, SOUTH HALL, LVCC

AN ARGUMENT FOR BEING FIRST.

On November 19, 1969 Charles Conrad, Jr. and Alan L. Bean became the second team of astronauts to land on the moon. And no one remembers.

The only way to get the glory is to be the first. In business, being first is also often the only way to survive.

CCA enables businesses to use information to stay ahead of competition.

Our Advantage Series products offer an unmatched combination of application development speed and sheer information processing power. With it, you can implement solutions in months instead of years and cut access time from hours to seconds. That kind of speed can open up a lot of space between you and your competition.

To find out about real speed, call CCA today: (617) 492-8860.

COMPUTER CORPORATION OF AMERICA

Computer Corporation of America, Four Cambridge Center, Cambridge, MA 02142

SPECIAL REPORT

END-USER COMPUTING

Strange bedfellows seek common ground

- Field trips into uncharted end-user territory
- Looking outside for PC support
- Gaining control of LAN management

WHAT'S GOTTEN INTO THEM?

EMC's 3090 Central and Expanded Storage.

EMC Corporation makes more powerful computer systems — even though we don't make computer systems at all. Instead, EMC turns the processing potential of existing CPU's into measurable gains in system throughput, people productivity and corporate profits. Which is exactly why more than 75% of the Fortune 500 have not only called our number — they've installed our products.

What kind of products? Products like EMC's 3090 central and expanded storage, which maximize utilization of system resources... which offer more configuration choices to match your applications more exactly... and which are comprehensively supported by EMC's worldwide sales and service organization.

EMC specializes in storage architecture — in moving data more rapidly, reliably and cost-effectively from where it's stored to where it's needed. That focus has made us an integral part of more than 1,500 IBM mainframe sites. And it has made our 3090 upgrades the right choice for companies that want to get a more powerful computer — without getting a new one.

For more information, call 1-800-222-EMC2 (MA residents call 1-508-435-1000) Ext. L948.

In Canada, call 1-800-543-4782

EMC^2

The System Enhancement Company.

*3090 and IBM are registered trademarks of International Business Machines

INSIDE

PC vendors look to end users for help in setting product directions. Page SR/7.

Parallel visions: User and IS perspectives on Pratt & Whitney's moves to empower the end user. Pages SR/8 and SR/9.

Users' appetite for new technologies: Boon or bane for IS management? Page SR/11.

Corporate networks could help rein in free-spirited PC users. Page SR/15.

End users take aim at IS weaknesses. Page SR/16.

IS ventures out of its ivory tower in search of a partnership with end users. Page SR/21.

Outsourcing PC support becomes an alternative for large companies. Page SR/25.

Upgraded training gives support staff a chance to convert end users to IS gospel. Page SR/29.

A field guide to the wilder creatures of end-user computing. Page SR/31.

Editor
Glenn Rifkin

Senior Editor
Amiel Kornel

Art Director
Nancy Koval

Managing Editor
Mary Grover

Assistant Managing Editors
Cathleen A. Duffy
Joyce Chutchian

Graphics Specialists
Frank C. O'Connell
John York

Computerworld Editor in Chief
Bill Laberis

Computerworld Executive Editor
Paul Gillin

Cover art by David K. Sheldon

DAVID K. SHELDON

Beware, IS: PC gurus are here to stay

Desktop management requires new spirit of cooperation

BY AMIEL KORNEL

At Amoco Corp.'s research center near Chicago, engineers and scientists jealously guard their autonomy in desktop computing. As they develop new products and processes for the oil company, they tolerate little interference from information systems people or anyone else.

"In a research environment, you run up against something called ego and creativity," says end-user support supervisor Mike Kuchaes. "They don't want any restraints whatsoever. And that makes support a living hell."

The clash between desktop libertarians and information systems authoritarians is not unique to the research environment. Common to most organizations ever since personal computers began proliferating in the corporate world, the conflict has left the management of end-user computing in a state of disarray.

However, a new bipartisan approach to the politically charged issue is in the making. IS managers and end users are smoothing over their differences and engaging in a new alliance that could give IS greater influence over personal computer management.

At the heart of the new alliance are highly proficient end users — variously called mavericks, outlaws or gurus — who have been leading the ragtag troops of desktop computing.

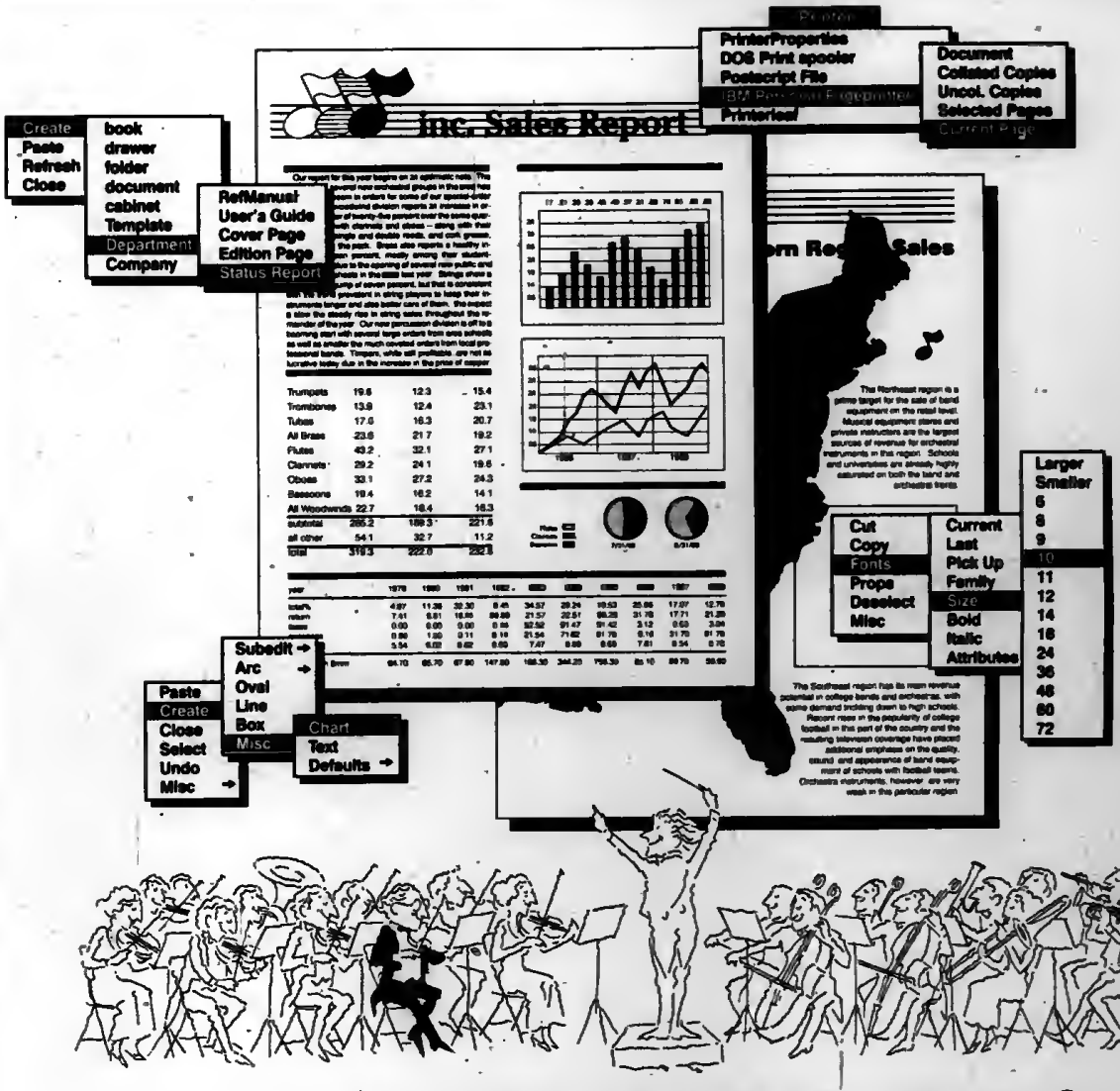
"The mavericks have much more power than they realize," says IS consultant Amy Wohl in Bala Cynwyd, Pa. "They're the only ones to know both the business and the technologies. In their area of competence, they're more knowledgeable than the IS staff."

Corporate executives are starting to recognize that PC gurus have been fulfilling an ad hoc role as IS surrogates for some time. To the surprise of many, they are learning that the underground activity of those people has been largely beneficial to the organization.

"They are at least equal to, if not better than, IS

Kornel is a *Computerworld* senior editor, features.

Why settle for a single player,



when you can have the whole orchestra?

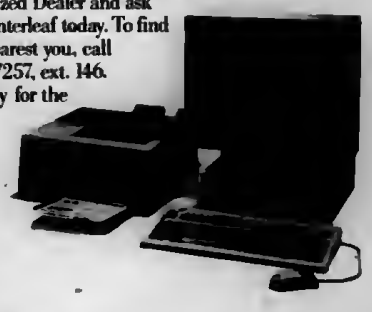
IBM Interleaf Publisher. The desktop publishing ensemble that does it all.

Until now, most desktop publishing software played only one tune. Some performed page layouts. Others executed graphics. Then there were the word processing virtuosos. And the charting soloists.

But now there's IBM Interleaf™ Publisher. It performs *all* these functions, and makes them work together in concert. So all you need is one desktop publishing instrument to do the work of many. What's more, the critics agree Interleaf does it all better and faster than the packages that only play solo. Which makes you more productive, whether you work alone or with others, on anything from simple memos to fully orchestrated publications. Especially when you add the power and speed of any 386™-based IBM PS/2® and the great-looking results you get with an IBM LaserPrinter.

Pop-up menus that let anyone play like a pro. Practice, practice, practice? Not with IBM Interleaf. Its pop-up menus lead you through any task. So you're free to improvise. Create. Even show off a little. And if you want to change your tune, that's easy, too. Start with a spreadsheet, and transform it into a pie chart, then to a bar chart, then to a line graph—instantly.

If all this sounds like an overture you can't refuse, contact your IBM marketing representative or IBM Authorized Dealer and ask about IBM Interleaf today. To find the dealer nearest you, call 1 800 IBM-7257, ext. 146. And get ready for the applause.



IBM

IBM and PS/2 are registered trademarks of International Business Machines Corporation.
Interleaf is a trademark of Interleaf, Inc.
386 is a trademark of Intel. © 1989 IBM Corp.

in satisfying end-user needs," says Harvey Shrednick, vice-president of information services at Corning, Inc. in Corning, N.Y.

Given the growing sophistication of PC users in general, the changing role of proficient users could be a harbinger of things to come. At many major companies, chief information officers are already telling their IS staffs to enlist users when defining overall strategy.

"We're trying to make sure that the user is heavily involved [in planning] so that their vision is implemented," said Max Hopper, senior vice-president of IS at American Airlines, while attending the recent Info '89 conference.

At the same time, workers' increasing computer literacy is leading many of them to demand more IS involvement on the desktop. Brian Williamson, personal computer services manager at First Security National Bank in Lexington, Ky., says IS is facing a "floodgate" because of "a tremendous pent-up demand for applications."

The IS pull

End users' growing need to communicate with colleagues and connect to host databases is pushing them into the arms of IS. And the ever-growing variety and complexity of applications are sending users back to IS clamoring for improved training and support.

At Houston-based M.W. Kellogg, for example, more than half of the engineering firm's 2,800 headquarters staff are technology-savvy engineers. An internal survey revealed recently that the company's training program lags behind the demands of users, says Linda Stettbacher, manager of planning and office automation.

"We plan to start a program on self-instruction by the end of the year to leverage our instructors and reach a wider audience," she says.

"SOME OF MY HIGHLY technical IS people fear that some of their ideas are going to be overruled by the more vocal power users."

HARVEY SHREDNICK
CORNING

It is no secret that IS — and some major computer vendors — once thought the PC was an aberration that would just go away if they ignored it. But millions of workers in offices, factories and laboratories saw the new tool as a way to increase their autonomy and effectiveness.

The transparent walls of the glass house seemed to turn opaque as IS refused to see that more and more corporate computing was happening on the desktop. Users who were crying out for business solutions that IS was unable or unwilling to deliver turned elsewhere for support.

Now, information systems managers are confronting the painful realization that their grip on corporate computing has been weakened by end users' continuing control of the desktop.

"With more of the computing in a company being done by end users, the proportion that IS has any control over is shrinking," says Eevelyn Arkush, vice-president at Index Group, Inc. in Cambridge, Mass.

Even IS departments that in the past kept close watch over end users are discovering they now have less influence.

Williamson, for example, thought he'd been spared many of the headaches dogging PC managers at other companies, thanks to the bank's centralized approach to managing the desktop.

That approach, Williamson says, has enabled him to head off connectivity problems by insisting that the bank's 250 PCs be IBM-compatible. Other institutions, he notes, looked the other way while individual workers and departments, paying scant attention to compatibility issues, installed whatever hardware and software they preferred to solve their business needs. Now, those same organizations are painfully trying to impose standard policies of information systems procurement and management on recalcitrant end users.

"That's like trying to close the barn door after the proverbial cow is already out to pasture," Williamson says.

Independent-minded cows in Williamson's own IS barn, however, seem to be edging out of their stalls. "As users get more sophisticated, they don't feel much guilt about branching out on their own," he acknowledges, before adding, somewhat perplexed, "Despite the fact that we always have been very centralized, we still have this problem."

Like Williamson, many IS professionals are discovering that their authority over end-user computing is tenuous at best. "We really do not have control of our user base and we never have," says Carol Hartwig, who until recently was manager of IS support at Corning.

In an effort to mend its relationship with the end-user community while acquiring greater influence in defining future directions of PC use, IS is turning to PC gurus. "Some companies are getting smart and seeing that's the person they need to sign up," Wohl says.

Corning, frustrated by end users' growing demands, earlier this year surveyed employees who used the company's installed base of 6,000 PCs and workstations. "We couldn't afford to supply the hungry appetites of those end users out there," Shrednick says. "As applications grow, hand-holding and training needs grow, and I couldn't keep throwing bodies at them."

From the survey results, Shrednick says he realized that end users were turning to departmental gurus as well as IS for support. Rather than trying to diminish the guru's ad hoc role, he decided to test shifting more formal responsibility to them, making central IS "the last recourse" for support.

A pilot trial in one business unit, completed in October, was highly successful. "Users and IS people were quite amazed by the amount of productivity improvements," Hartwig says. Corning IS managers are currently evaluating if and how the program could be extended throughout the company.

That may not be easy. As they pursue the new alliance, IS managers at Corning and other companies worry about encountering resistance from IS staff. "Our users tend to accept change easier than our DP folk do," Hopper says.

"MY EXPERIENCE is that although a lot of IS people can intellectualize about the value of end-user computing, deep down inside, they think it's awful."

EEVELYN ARKUSH
INDEX GROUP

"Some of my highly technical IS people fear that some of their ideas are going to be overruled by the more vocal power users," Shrednick says.

At the heart of the issue is a cultural divide that could prove difficult to bridge. "What you're looking at," says Gerald Hoffman, an IS consultant in Chicago, "is 20 years of accumulated hostility between IS professionals and the end-user community."

Their training and experience has inculcated IS professionals with values stressing the importance of using a systematic and structured approach to managing a company's computer and communications resources. Adequate backup, documentation, security and careful planning and analysis are essential virtues in their universe.

The antithesis

"End-user computing is the antithesis of all that," Arkush says, "so they think it's wrong, that it hurts the company, that it's irresponsible. My experience is that although a lot of IS people can intellectualize about the value of end-user computing, deep down inside, they think it's awful."

"It's just difficult to sit back and watch users make mistakes that people in data processing learned from decades ago," Williamson says, "and not to worry about what that means to my institution."

From IS management's point of view, the problems that need addressing on the desktop are many. Data security and integrity have been largely neglected by end users, they complain, while ensuring systems compatibility has become a nightmare.

At Amoco's research center, the presence of dozens of incompatible machines among the site's 720 PCs inevitably poses connectivity problems for Kuchaes' 12-person support staff.

"Users go out and get esoteric platforms because it solves a specific need. And then, six months down the line, when they want to send data somewhere or merge it with something else, they can't. So we have to go around creating black boxes" that interconnect disparate hardware, Kuchaes says.

Virus worries

Widespread micro-to-mainframe interconnectivity at Amoco also has him worried about security. "There are a bunch of viruses out there just waiting to get in," he says — some from unknowing end users who may have picked them up when copying software from a colleague at an academic institution.

Data security and integrity are also important issues at First Security National Bank. Williamson says federal bank examiners who have begun to realize how much mission-critical information is being stored on PCs are showing increasing concern about end-user-developed applications.

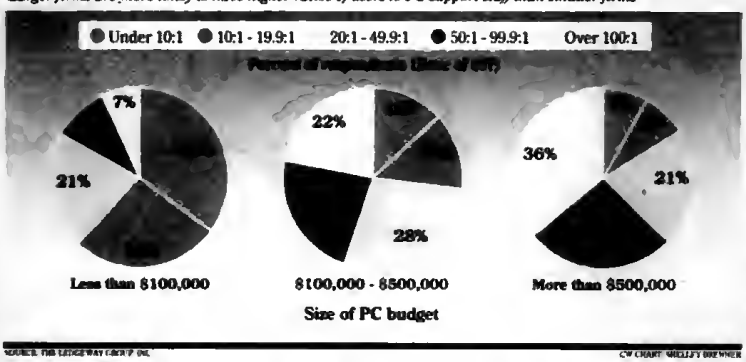
As a result, recent federal recommendations stipulate that an application should be considered "outlaw" unless users present "physical documentation of code, instruction sheets and a backup copy of the system and data," Williamson says. "Users should be wary about striking out on their own; we have been empowered to do something about it."

An overt push by IS to take control of the desktop, however, could spark a new battle with end users, who are unlikely to give up their freedom without a fight. "Some users are far too independent and knowledgeable to accept IS intervention," Wohl says. "They have hard-won skills and don't want to see someone come along and disenfranchise them."

In their quest for greater influence in desktop computing, IS managers will clearly have to walk a fine line between the demands of end users and the concerns of their own staff. •

IS turns to PC gurus

Larger firms are more likely to have higher ratios of users to PC support staff than smaller firms



SOURCE: THE LEDGE WAY GROUP INC.

CW CHART: SHELLEY DREYFUSS

Vendors shift attention to end users

BY AMIEL KORNEL

A vendor can no longer live by IS alone. Personal computer hardware and software companies are eagerly courting corporate end users who can help them define their product development and marketing strategies.

Compaq's Canion

Listening only to the needs of IS, analysts say, has not always led marketers down the best path. "Vendors are beginning to find that all of the stuff coming from IS is very skewed," says Jerry Schneider, a Washington, D.C.-based consultant in end-user computing and marketing. "A lot of planning has stressed mainframe usage. There are a lot more attempts by these companies to reach and talk to end users to set their directions," Schneider adds.

Senior industry executives confirm that they increasingly try to draw users into their planning. They point to trade shows and user groups as forums in which their companies try to plumb the needs of end users. They also say it is not uncommon for IS managers making visits for product demos to bring along a power user from their organization.

Executives agree that power users play a significant role in determining the course of desktop computing.

"They represent a minority," says Rob Dickerson, vice-president of product management at Borland International, "but they are a very vocal minority. They influence the IS manager, and they also influence product direction."

This message is not new for Apple Computer, Inc., which owes much of its success to the fact that its non-IBM-compatible computers have long epitomized end users' right to be different, much to the annoyance of many IS professionals.

Apple's Loren

"Our success is in our design point — and that is the individual," says Allan Loren, president of Apple's U.S. operations.

Even now, as Apple concentrates more on penetrating large corporate accounts, its end-user focus remains firmly entrenched in its marketing orientation, Loren says. "We see the individual becoming more and more influential and more and more powerful," he adds.

Not all vendors see the balance of power in corporate computing leaning even further into the end-user camp.

"I think the pendulum is swinging back toward MIS," says Rod Canion, president and chief executive officer of Compaq Computer Corp., "but it's going to stop somewhere in the middle. Each side is understanding realistically that they have to work together."

Borland's Dickerson

"There really is no issue of managing PCs without support from MIS," says William O. Grabe, IBM vice-president and assistant general manager of marketing, "since both entities ... should work together for common goals."

Canion sees users' need for greater interconnectivity with colleagues and host systems as key to driving them back into the IS camp. "It's no longer an individual person or an individual PC," he says. "It's really a group trying to work together."

Microsoft's Maples

Mike Maples, vice-president of applications at Microsoft Corp., says he believes that technology will allow companies to reconcile the sometimes-conflicting priorities of end users and IS. He points to graphical user interfaces, common user access and multitiered local-area network-based architectures as key bridges between IS and end users.

These technologies, Maples says, will afford workers "the impression of availability and discretionary use" of end-user computing tools, while providing IS a more effective mechanism for managing corporate information.

Grabe says IBM is trying to do just that with its Systems Application Architecture. "The single PC user still has the independence of action that he or she has always had, within a resource and standards envelope that encourages them to work with others," Grabe says.

These innovations won't necessarily make IS' role any easier, industry executives warn. "Even if the software vendors do a terrific job," Dickerson says, "it's not going to simplify life for the IS manager. The complexity of the data flow going on behind the scenes is going to go up and up and up. And the complexity of the connectivity issues is going to grow." ●

Call For Directory Assistance

The next time you need help finding computer hardware, software, telecommunications, consulting or training, make sure you have the INFOMART Directory handy. This free 60 page directory is your guide to everything the more than 90 companies at INFOMART offer.

Call for your free INFOMART Directory today and ask how our exclusive Executive Briefing Service can assist you even further by coordinating and expediting your entire visit to INFOMART.

INFOMART

Where the leaders in automation share their knowledge with you.

1-800-232-1022

INFOMART, 1950 Stemmons Freeway, Dallas, Texas 75207

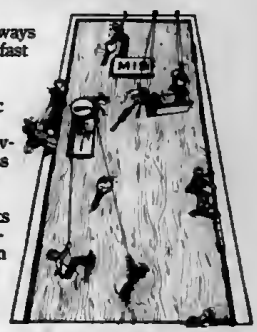
INFOMART is a registered servicemark of IBM Partnership.

Unlocking mainframe resources: spreadsheets.

Why should you be in a crunch just because your end users need numbers yesterday?

Your overworked DP staff can't always download end user spreadsheet data fast enough to meet the demand.

But now there's a way out of the numbers crunch: the Trax Electronic Spread Sheet (ESS®). It makes file downloading a thing of the past by giving end users direct, controlled access to spreadsheet data from your IBM mainframe.



ESS is the key. ESS spreadsheets are limited only by mainframe capacity. Windows let end users view data in just about any combination. There's online help, 3-D spreadsheets, integration of PC spreadsheet data, even macro processing.

And anyone who knows the more popular PC spreadsheet packages already knows ESS. For real flexibility, use ESS with EdWord,® the Trax word processing program, to integrate numbers and text.

Trax is the key. Join the more than 500 companies using Trax products around the world. Contact Tom Cox, 10801 National Blvd., Los Angeles, CA 90064. FAX: (213) 470-2487. Telex: 350048. Telephone: (213) 475-TRAX.

ESS and EdWord are registered trademarks of Trax Softworks, Inc.

Trax Softworks, Inc. Unlocking end user productivity on your IBM mainframe.

Eye to eye: End user discuss reaching out

STEVEN LEWIS

Bob Zweiben, senior staff specialist in business development and planning at Pratt & Whitney, the East Hartford, Conn., jet-engine subsidiary of United Technologies Corp. Zweiben develops and uses analytical systems that help senior management predict the consequences of business alternatives. Armed with a master's degree in computer science, as well as an MBA, the 42-year-old Zweiben has distinguished himself as a proficient personal computer user. As a result, he has become a bridge between the 30 people in his department and information systems staff. He recently spoke with Computerworld Senior Editor Amiel Kornel about his strong advocacy of the firm's plan to make IS more responsive to user needs.

Is being a PC guru a recognized part of your job description?

It has been in the last year. It's been made explicit. Before that, it was a lot less formal. IS reorganized, and we felt there was a need that our strategic planning organization interface more formally with the changing IS organization. We have a new vice-president of information who started to implement some changes that will hopefully help the end user. Our group stays on the leading edge, and so it is important that we have a good rapport with information systems. I was assigned to make sure that our relationship works. I'm trying to educate IS about what we do, how we do it and our needs and hopefully get a better partnership, because we really do need their resources. It's tough to act all by yourself. One solution is common education.

What kind of problems were you encountering before IS reorganized?

Until a year ago, end users basically were given a low priority in terms of looking at their problems and their needs, at looking at how their business worked. In planning and in many other areas, there are a lot of creative people who would be given a task, and if it didn't fit in with the standard way the majority of IS people worked, they would either have to go along with an existing standard or they'd have to push the frontier. We weren't really given a lot of help in pushing the frontier, in looking at alternatives. So it forced a few people to become technical. And, of course, the PC came along. It allowed us more alternatives. But we weren't given a lot of support.

> "I'M TRYING to educate IS about what we do, how we do it and our needs and hopefully get a better partnership, because we really do need their resources."
>
> BOB ZWEIBEN
> PRATT & WHITNEY

Many IS people see connectivity as the reason — and the excuse — to regain control over what is happening on the desktop.

That's true. There is still the thinking that the mainframe system is the only reason for being, and if you want a PC, it has to be hooked up to the mainframe. Most [IS] people can't even understand why you would need a stand-alone. With some creative end users who can work with the PCs and put things together, who have a business knowledge and also a technical knowledge of the PCs, we can address the different [business] scenarios and put together information that management can use in a more responsive way.

Until now, how well have the IS people in your company understood your business needs?

I don't think they have a very good knowledge of our business needs. Hopefully, this

Continued on page SR/10

and IS professional to bridge the gap

Dudley Henderson is manager of Office Systems Technology at Pratt & Whitney. Responsible for supporting the organization's 2,000 personal computers and 10,000 mainframe-connected terminals, Henderson is in charge of implementing Pratt & Whitney's strategy of granting users greater autonomy in the management of their PC resources. Senior Editor Amiel Kornel spoke with him recently.

STEVEN LEWIS

What is your mandate in terms of managing PC resources at your company?
Basically, the thrust is to move toward empowering our users to take advantage of the technology. The bottom line is an orientation toward speeding the delivery of the tools into the customer's hands and enabling him to take advantage of them without depending on MIS as he has in the past.

How have you organized end-user support, and how is this different from the way it was managed in the past?
We took the very technical hardware and software support, the [two] infocenters and a group of people who were supporting executive information systems and put them together in Office Systems Technology. We then split the OST group out of the data center and had it report directly to the vice-president of MIS [Doug Lewis].

Why was the change necessary?
The general view was that by having [the support function] so intimately tied to MIS, it was not being responsive enough to the end-user customers.

Did the growing proficiency and independence of end users play a role in driving this organizational change?
I would say partially but not totally. I think the drive is coming primarily from the vice-president of MIS, as opposed to being user-driven. Clearly, we have users out there who are much more aware of the technology and what it can do for them than there were five years ago. But I really think MIS has taken the initiative here. There's no question that it was in response to a lot of concern on the part of our customers that we were not being responsive enough.

Have you also looked inside the company to find help in improving your end-user support?
Yes. As a matter of fact, we have several process-improvement teams under way right now that are made up of MIS and customer people. We're using them in a series of focus sessions where we ask for their participation. We're trying to improve our response to them in terms of the acquisition process and the installation process. We're also using it to analyze what we should do to improve our customer-systems side and to determine, document and measure our response to their expectations.

Are you doing anything to harness the knowledge of your most proficient users?
We're working towards the implementation of a network of departmental consultants in which we will create partnerships with certain selected

Continued on next page

"OUR GOAL is literally to extract MIS from the process wherever possible, allow end users to acquire the tools and use the tools proficiently without MIS standing over their shoulders."

DUDLEY HENDERSON
PRATT & WHITNEY

Henderson

FROM PREVIOUS PAGE

people in the various user groups and use them as a front-line support for our customers. We're getting ready to launch that program. It soon will be in place, very likely during this calendar year.

They're already out there now. They're doing it on an ad hoc basis, and what we're hoping to do by partnering with them is be able to make them part of our strategic planning.

What particular challenges, difficulties or opportunities do proficient end users create for you?

End users certainly don't represent a challenge to us. They represent an additional resource we can use. It is really in keeping with the theme of empowering our user base.

Our goal is literally to extract MIS from the process wherever possible, to stand out of the way wherever possible and allow them to acquire the tools and use the tools proficiently without MIS standing over their shoulders.

Do you think information systems at your organization is well tuned to the business needs of end users?

I think we are. There is a lot of work going on from an overall information systems perspective to align ourselves more with business issues. I wouldn't say that it's outstanding by any means. That's a classic problem with MIS today throughout industry. But I think there has been an attempt to do some tie-in.

How important is the adherence to hardware and software standards in end-user computing?

Well, that is a tough question, and right now we are taking a position that following standards is quite important. We are trying to have an approach to our office systems where we can eliminate the wasteful duplication of application development.

> WE'RE WORKING TOWARDS implementing a network of departmental consultants where we create partnerships with certain selected people in the various user groups and use them as a front-line support for our customers.

In addition, if you look at using the mainframe as a delivery vehicle for a lot of generic office functions, then you really want to have some kind of standards. We have defined what we consider to be a strategic class of applications.

And in those areas — spreadsheets, word processors — we are establishing a standard architecture that you have to be compliant with and then core products for which we will give support.

How do you reconcile your vision of a need for standards and for control over end-user-developed systems, and the need for a companywide architecture with a mission of empowering the end users?

What we're really talking about here are tools to satisfy our business, which is to manufacture and sell jet engines. What we do here as an organization has to be focused on that.

What we're really saying is that we're going to establish an overall architecture and standard core products, but as long as a product complies with the architecture, we have no problem with that. Where something is totally outside that, we're not saying we'll exclude it, but there has to be a good reason.

I don't think there is a conflict if your main focus is conducting your business. The problem in the past has been not so much the standards but the MIS mentality that says we have to control everything. We really don't have that philosophy here.

Do you think users will perceive your actions as an effort by IS to gain greater control over PC resources at Pratt & Whitney?

No. As a matter of fact, we are making decisions right now that the capital funding for this kind of equipment will be pushed back into the customer budgets. Budget responsibility and the ordering process is going to be changed dramatically. MIS is not going to be in the process. We may have to coordinate, but we are not going to have approval.

So I don't think they're going to perceive it as control. I think they're going to perceive it as some guidelines to make sure that we, Pratt, are focused in the right direction.

Despite what you said about corporate direction, would it personally make your job easier if you had greater control over PCs at Pratt & Whitney?

No. The thing that would make my job easier would be to know what is out there, not to have control of what is out there. Whether or not there was MIS control over the past five years, there were a lot of PCs brought in without the knowledge of MIS.

We're hearing from people whose hardware configuration and software constraints we do not really understand. We have a lot of people who order software that will not run on their systems, and we are not aware of the lack of compatibility ahead of time. We are creating a database now, and we have it basically completed. It gives us a way to communicate with our users.

If we looked at Pratt & Whitney over time, would we see that end users are in fact gaining greater freedom?

I'm not sure their perception today would be that, but I can guarantee their perception by the end of this year and by early next year will be.

Many of our end users have already been influenced by the things we're doing; others will be shortly as we break down the barriers. •

KEDIT 4.0

XEDIT COMPATIBLE PC EDITOR

KEDIT™ is a text editor for DOS and OS/2 that supports most commands and features of XEDIT, IBM's editor for VM/CMS. But KEDIT goes beyond XEDIT compatibility with special PC-based features for a first-rate combination of mainframe power and PC flexibility.

- **More than 100** XEDIT compatible commands and SET options, including the ALL command.
- **XEDIT prefix commands, targets, and fullscreen layout.**
- **Multiple files, multiple windows.**
- **Built-in subset of the REXX** macro language included.
- **Interfaces to Personal REXX,** our complete implementation of REXX.
- **Enhanced block operations.**
- And much, much more.

"While KEDIT remains true to its heritage in retaining compatibility with the mainframe XEDIT, it is also one of the most feature-packed PC text editors around"
PC Magazine, 10/31/88

DOS Version: $150
OS/2 Version: $175
(includes DOS version)
Shipping: $3
Demo version available.

MANSFIELD Software Group
P.O. Box 532, Storrs CT 06268
(203) 429-8402

KEDIT is a trademark of the Mansfield Software Group, Inc

Zweiben

FROM PREVIOUS PAGE

will now change. Up until the last year, we haven't really had the information systems community try to find out what we do. We've never had the discourse to convey that.

Is that what caused you to become such a proficient end user yourself?

Oh yes, yes. Definitely. Once again, we had jobs to perform, jobs that I thought were important for me to accomplish and important for our group to accomplish. I found that I had to rely on myself technically. I got the package, and I had to learn it. You always need to get some help in an area, and I'm not always sure that I can count on that from information systems. Maybe not.

Are you obliged to adhere to companywide PC standards in terms of equipment or software?

My group is just putting together an order for a combination of software and hardware, and I'm interfacing with the Office Systems Technology [end-user support] group to coordinate purchasing those products.

Several of the items are what our company would call nonstandard. The response we have had so far is, "We understand your needs, and fine, we will order it for you." So I'm seeing progress in that area. I can get what I need as long as it's not crazy. At least I have the forum to discuss what we need and get some reasonable responses.

Do you feel you need even greater freedom and independence than you have now?

I would say that right now I am happy.

Would you accept more constraints from IS?

I wouldn't like to. I think that a reasonable amount of flexibility is needed to be able do my job in an optimal way. I would like to see that ability to make reasonable choices continue.

Has being the departmental PC guru helped your career?

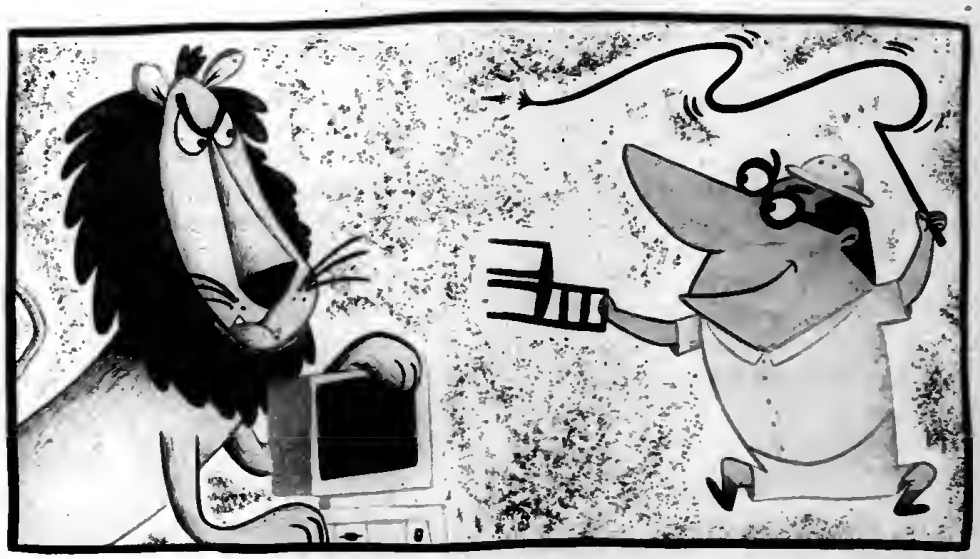
My role in producing information in a better way has definitely been appreciated by my supervisors, unlike some cases where the local gurus — I'm just talking generally, not in my company — get hurt.

Have you spoken to people to whom that's happened?

Yes. I think that's probably more prevalent than not. A lot of gurus tend to get hurt because it's not consistent with their specific job responsibility.

Do you think some members of the IS staff feel threatened by you?

My feeling is that IS respects me for the things I do — maybe under the assumption that I know my stuff. I need support from both my management and information systems because, in a way, my job cuts across both. I'm a planner who has to do a reasonable amount of work on information. I'm going to be optimistic that we're moving down a good road. It's going to be a bit bumpy, but I think I've seen a change in philosophy and direction. •



DAVID R. SHELDON

Taming end-users' technology appetite

BY ALAN J. RYAN

Satisfying those who want it all presents a challenge to IS

It starts out quietly, like a chant at an ice hockey game that has only one or two voices behind it. However, when end users start to get hungry for new technology and more power, the chant can become an all-enveloping thunder directed at the information systems department. "We want the latest. We want the greatest. We want it all. And we want it now."

This need creates a difficult challenge for IS management as companies prepare to plunge into the 1990s. New technology will possibly mean more headaches for IS managers who are mandated to maintain tight control over their company's information.

For those who say their mission is not that rigid, new technology will likely make them the heroes of their companies.

Managers say that some of the things today's more sophisticated users are interested in include graphics, Unix, networking, computer-aided software engineering tools, multimedia, applications development, compact disc/read-only memory, laser printers vs. other types of printers, larger and larger hard disks, high-speed networks, write once, read many technology and scanners.

More power to you

Many technologies, such as powerful workstations and increased-capacity personal computers, will give users more power on their desktops. But some of the technologies evolving today will also bring more power or responsibility back to the halls of IS.

At the Providence Journal Co. in Providence, R.I., systems analyst Peter Scheidler says that one of the technologies he is most interested in is high-speed, 100M bit/sec. Fiber Distributed Data Interface networks.

However, because such a network will eliminate the requirement of individual disks, "all of the information will end up in our lap, and we will be responsible for it. In the past, all of the users were responsible for that information. That is going to make my life tough," Scheidler says.

New technology is changing the way information systems works, says Thomas O'Leary Jr., director of MIS technology at North American Philips Corp. in New York.

When the new technology has the potential to transform a business function and to change the manner in which the company does business and the way workers do their jobs, the implications are great.

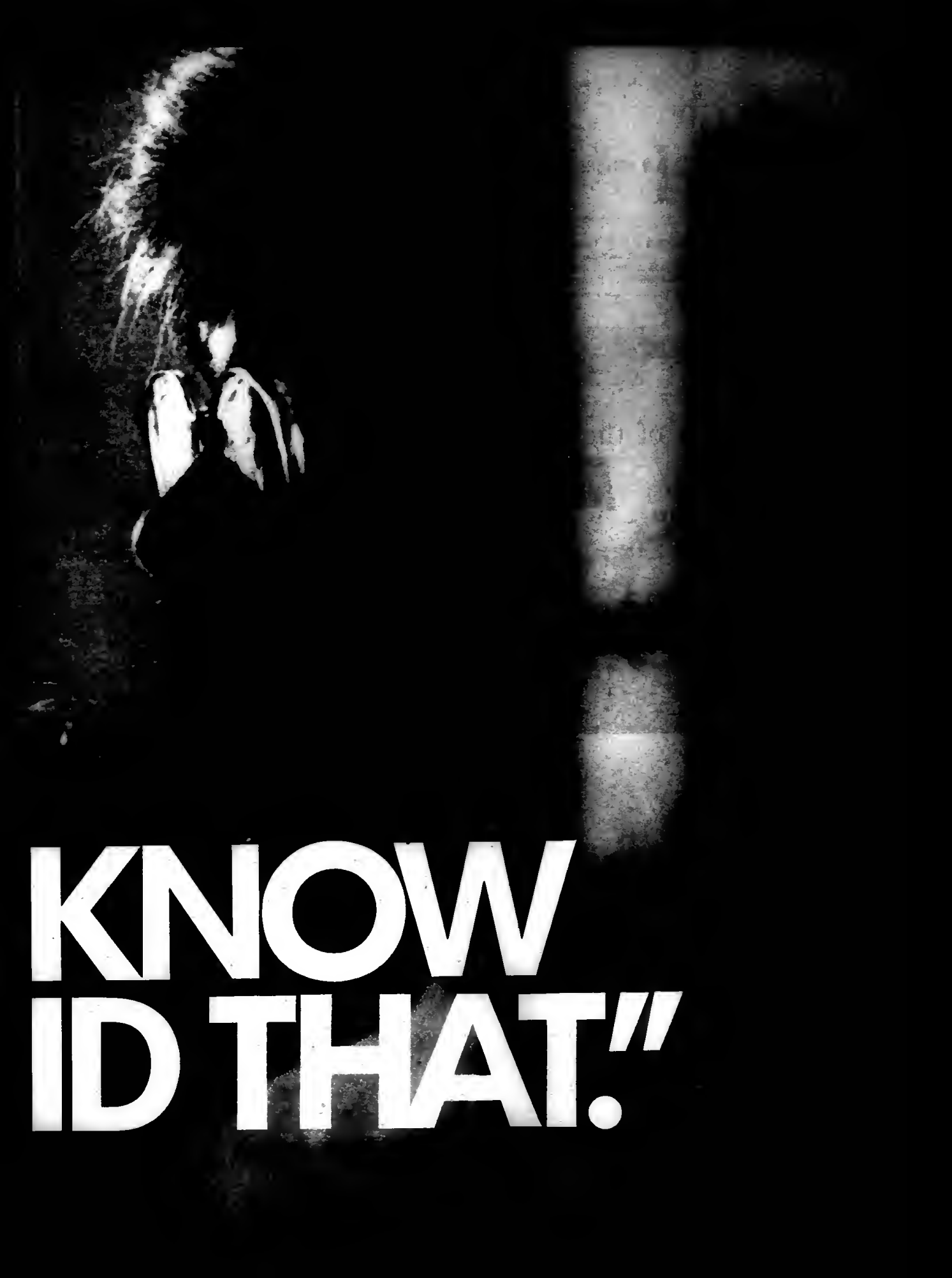
"It brings up issues of possible new business offerings as a result of the technology; it brings up issues that are really fundamental to the business and issues that cross departmental lines," O'Leary says. "So, you really need a multidisciplined team to implement that kind of change — it is not just the IS people."

Peter Duray, the corporate technical support manager at Polaroid Corp.'s Waltham, Mass., office, says users are allowed to select many of the systems they purchase for their departments. While he usually tries to manage user expectations, he says that when they simply go out and buy new packages or systems, it can leave him in an awkward position.

"They want seamless interconnectivity," Duray says. Everything they bring in should simply plug and play. "If we don't get the chance to manage those expectations, we are caught trying to catch up and do things we didn't plan for," taking time away from projects that could have companywide implications.

Avid technology users "are

"I DIDN'T CODEX D


KNOW
ID THAT."

complicating my life like crazy," says trainer Mike Wright, department chairman of microcomputer management technology at the State Technical Institute in Memphis.

To avoid those widespread woes, IS must be willing to work with the users to bring about systems that will be beneficial to both sides, says Jay Scussel, vice-president of systems development at K Mart Corp. When part of the company needed a payroll system, he said at a recent conference, the systems department looked carefully and selected a package. It was never installed.

"The users didn't want it. It was our solution, and while the users wanted the problem solved, our package was not the one they wanted," Scussel says.

> "IT IS HARD for me to give up control, but I'm trying."
>
> MICHAEL ACKERMAN
> SAN FRANCISCO CHAMBER OF COMMERCE

Additionally, IS managers have to be more willing to part with some of the control they might currently have over their systems. Michael Ackerman, manager of support services at the San Francisco Chamber of Commerce, says, "It is hard for me to give up control, but I'm trying."

IS is not alone in needing a new outlook. Users must also be willing to take some direction and some practical instruction from IS. "There are areas of the company that are more technically infatuated," Duray says, "but with tight budgets and with a smaller work force at Polaroid, we tend to have the leverage to say we just can't do that unless you have a really good business justification for it."

Loosening the reins

For the 1990s, good information systems groups will not strive to have total control. "We are here as a support organization," not as dictators, one IS director says. If a user needs a piece of hardware or software that is not supported or recommended, it can still find its way into our organization, he adds.

> IT IS NOT always practical to expect the IS director to be an expert in all areas.
>
> PETER DURAY
> POLAROID

"There are always esoteric applications and needs that we can assist with but may not be able to take the lead on," he adds.

According to microcomputer managers, educators and information systems directors at both small and large organizations, it is beneficial to everyone to let users have at least some modicum of the power they desire while staying within the company's set boundaries of standard products.

"When a user starts talking to you, he probably knows a heck of a lot more about that particular subject than the IS professional because the IS professional can't be the font of all knowledge on everything," O'Leary says.

It is not always practical to expect the IS director to be an expert in all areas, Duray agrees. "If I want to see my family or get any sleep," he says, it is simply impossible to be an expert on everything.

When it comes to a clash between IS and users, "you really try to put it on a business basis," O'Leary adds.

"And, in the final analysis, the executive management of that business unit needs to weigh the facts and approve the hardware or software choice." ●

State of the Art

State of the Science

Managing information is a science.
Managing people is an art.
Get the best of both, worldwide, with the IBM System/38 or AS/400 and Financial and Human Resources Management systems from Software 2000.

- The Human Resources 2000 Series
- The Financial Management 2000 Series
- Application Manager 2000: The AS/400 Platform of Choice

Software 2000

Mainframe Caliber Software for the IBM Midrange

Software 2000, Inc.
One Park Center • P.O. Box 6000
Hyannis, MA 02601
(800) 525-0490

• ATLANTA • BOSTON • CHICAGO • DENVER • HYANNIS • LOS ANGELES • LONDON •

Reining in departmental LANs with companywide networks

As more information is used, linking LANs to corporate systems is a must

BY MICHAEL L. SULLIVAN-TRAINOR

User demand for instant access to information is requiring information systems to link departmental local-area networks with corporate systems. In crafting these connections, IS is gaining more control over the management of LANs.

"LANs are a significant opportunity for IS to reassert its authority and establish standards," says Jack Karp, vice-president of desktop computing at the Meta Group, Inc. in Westport, Conn.

This trend bodes well for everyone. IS can rein in networks that do not conform to corporate standards. Users can turn over increasingly complex connectivity and applications dilemmas to the technologists.

"Users are seeing information as a critical resource," says Trish Fineran, an independent consultant specializing in end-user support in Drexel Hill, Pa. "Technology is helping them to get the information and put it in a form they can use. The LAN has allowed them to do that. But now they want to do more with the information, and they need greater technological capability. That's where IS comes back into the picture."

However, increased IS management of LANs creates two difficult issues:

- Differences between IS and user implementations of LANs are brought to the surface by the need for corporate connectivity.
- IS support of LANs through decentralized groups can result in contention between departmental IS and the corporate staff.

Once an outgrowth of departmental PC usage, LANs now come into an organization through both user departments and corporate IS. End users acquire LANs to serve local needs; these installations are often not overtly supported by IS. Meanwhile, IS usually purchases LANs as a link to primary corporate systems as part of an overall strategy.

Both routes often coexist in one operating environment. For example, at the Federal Reserve Bank of Oklahoma City, Dan Straughan, operations supervisor, is implementing a LAN despite user resistance. His counterparts at the Federal Reserve Bank of Kansas City are also installing LANs but only after losing a battle with users to prevent their adoption.

"This decision is almost strictly IS-driven," Straughan says. "We have several manual processes, and if we automate them, we will do them faster."

Straughan anticipates that installing a LAN will save the bank $30,000 in the first year of operation. Initially, he is starting with a small server and four workstations, which will eventually grow into a bankwide network.

Even though the Kansas City Federal Reserve Board, the region's head office, dictates LAN policy — specifying that banks use the IBM Token-Ring with Novell, Inc. software, for instance — the IS group is less excited about LANs. They are installing a bankwide LAN that will eventually support 60 to 70 users.

"LAN installation is more often user-driven, and it should be," says Keith Logan, who is in charge of the LAN project at the Kansas City Fed. "The applications need to be there. You don't want to spend money on a LAN and not have a use for it."

In another case, users at Pioneer Hi-Bred International, Inc., in Johnston, Iowa, are clamoring for connectivity for their personal computers. But the IS group, Pioneer Data Systems, is moving slowly because of technical and economic constraints. Pioneer's system relies on Digital Equipment Corp. VAXs and Ethernet, a centrally managed environment that is expensive to forge outside links with. The company's systems structure will have to change significantly to allow

Sullivan-Trainor is *Computerworld's* senior editor of special projects.

Battle of the desktop: It's almost over

We went to the trenches to get a firsthand account of the battle for control of the desktop. To our surprise, we found that as far as end users are concerned, the war is largely over. And there's little doubt about whom they consider the winner. They repeatedly cited the considerable freedom they continue to enjoy in managing their personal computer resources and expressed sympathy for the budgetary constraints under which information systems must labor. Most of those contacted seemed content with the current state of affairs and ready to call a truce.

However, with some prodding from *Computerworld's* Jodie Nunn, the following end users agreed to tell us what they think could be done to improve PC support in their organizations.

Our MIS department is PC-literate. One of the hardest things of all is to dialogue with the MIS department. They tend to talk in macros and systems levels. The change will come about when IS management stops focusing on the mainframe and starts focusing on the total solution.

Patrick Howard, telecommunications product manager at McDonnell Douglas Field Services, Santa Ana, Calif.

The Help desk could be more helpful. Sometimes I get totally frustrated when what I'm looking for is the fix or the solution to my problem right now, and it isn't always there.

Susan Walsh, executive secretary to the vice-president of finance at A. M. Castle & Co., Franklin Park, Ill.

The MIS department needs to be able to communicate more of their knowledge to us up and users to [illegible] efficiency. You can take [illegible] will tell you how to build a spreadsheet, but then they might not explain the most efficient or effective way to build it.

Bill Dunn, assistant controller in the accounting department at Seminole Community, Lakeland, Fla.

wide use of LANs, according to Sidney Jacobson, microcomputer manager. Yet the users want to reap the cost savings that PCs and PC software can provide.

"The rumblings have become a push for networking," Jacobson says. "But we have been able to stave it off because we don't have sufficient resources. We plan to go through it methodically."

Pioneer has 90 networked PCs, more than half of which are being used by programmers working with a National Advanced Systems Corp. mainframe. More than 250 PCs are installed.

In companies where users have developed numerous LAN installations on their own, IS groups must decide how much support to provide networks that do not conform to their standards and, therefore, make connectivity to corporate systems more difficult.

For example, users in one large utility had installed 40 LANs — many from different vendors with different architectures. The utility's IS group felt it would be a waste of resources to support all the installed LAN types, so they chose to standardize on Token-Ring.

To encourage a transition to Token-Ring, the group offered free add-in boards for PCs, installed fiber-optic cable and essentially created a communications environment that would make users' transitions to Token-Ring as easy as possible.

Still, some of the users refused to switch over, and they are running their own LANs today — with minimal support from IS.

Besides urging users to conform to standards that will make corporate connectivity easier, IS organizations, in some cases, must also learn some lessons about the differences between LANs and large systems projects.

Faced with the need to respond to user LAN requests quickly, IS professionals sometimes overlook the requirements definition for traditional systems.

"In dealing with power users, you're working with a moving target and IS can't keep up," says Nick Wasliawski, director of systems development at the U.S. Navy Aviation Supply Office.

For example, Wasliawski's staff developed a LAN application for end users who simply wanted to rearrange spreadsheets. The application required the

Presenting InfoImage solutions. A totally new kind of imaging system: Practical.

UN

handling of large amounts of data that quickly degraded network performance. "It's not just a matter of changing the software. We have to wait for the next generation of products to meet the needs," he says.

To guarantee that IS professionals know where user requests will lead, many companies have decentralized LAN support, assigning technical professionals to user departments. But this solution creates a new set of problems.

For example, Louisiana Power and Light is struggling with linking local networks with larger corporate systems. One of the primary areas of contention is between decentralized IS groups within user departments and the corporate IS organization.

In one case, a decentralized IS group installed a Unix-based network in a key department even though corporate IS does not support the use of that network for the rest of the company.

"Companies have to decide whether to optimize the business unit or the corporation. Different corporations decide that issue in different ways," says Eevelyn Arkush, a vice-president at Index Group, in Cambridge, Mass.

Despite the difficulties, Arkush says, it is more effective to decentralize end-user LAN support than to run it from a central group. The main reason for this is that IS can manage technology from a distance, but the only way to manage the changes technology brings is by living in the user departments. "When IS professionals are out with the users," she says, "they start to make a shift to understand the nontechnical problems. In the centralized structure, IS is like the high priest speaking from the mountain and no one listens."

FACED WITH THE NEED to respond to user LAN requests quickly, IS professionals sometimes overlook the requirements definition for traditional systems.

Other observers advocate a return to central LAN support. "What organizations need is a focused IS group to support LANs in a central fashion. It's taking time for that to happen because it requires crossing organizational domains," says Scott Stein, a senior PC analyst and director of strategies for microcomputers and office systems at Framingham, Mass.-based International Data Corp. "The organizations that are struggling are the ones that are trying to maintain the decentralized mode."

The bottom line is that while there is no easy answer to resolve LAN management problems, the requirement to link LANs to corporate systems is inevitable as users become more sophisticated in their use of information. •

The promise of imaging technology—computer storage and management of essential documents, and elimination of your paper burden. It's a promise many computer vendors are still struggling with.

It's a promise Unisys has kept.

Presenting the Info Image suite of practical imaging solutions. Integrated, total systems designed around your business.

Solutions that work with your existing computer environment. Practical imaging solutions only a total information systems company can give you.

Take Info Image IIPS, a virtual money-making machine for banks. It digitizes checks to process them faster than any conventional system. The cost of operation drops dramatically while throughput increases.

There's Info Image EDMS, our Engineering Document Management System. It reduces the costs, errors and delays associated with managing and distributing engineering documentation.

More imaging solutions are on the way. They're based on modular implementations and open architectures to work with your existing environment. They all upgrade for more capacity and new technology.

If you're looking for imaging technology that's real and practical, instead of practically real, call for our free demonstration diskette

UNISYS AND YOU
The power of²

iSYS

FREE DEMO DISKETTE!
Call us at 1-800-547-8362 to see what InfoImage technology can do for you.

. . . or is it?

I would like to have more training than just what is received off-site. Once I have had the training, little questions always seem to pop up. I don't know how feasible it is, but it would be nice for them to let us know about updated versions of certain products that are available. They should be feeding us this information right along.
Marsha Curry, executive secretary at Ciba-Geigy Corp., Tom Rivers, N.J.

I know they don't have the manpower to be with everyone, but I learn best with hands-on experience. I would like detailed classes involving projects that are job-related. If someone is sitting next to me while working on a specific project, I seem to get more out of it at first, rather than trying to apply what I have learned in the classroom to my job by myself.
Lorraine Lamrouette, senior clerk in undergraduate admissions at State University of New York in Stony Brook, N.Y.

The one thing that I find is that the documentation could sometimes be a lot better.
Clark Dilph, manager of corporate budgeting at Ingersoll Rand Co., Woodcliff Lake, N.J.

It's staffing that's the problem. If you want another level [of service], you would need to have a quantum leap in staffing. It would be nice if we had the resources to get more support from IS in terms of PC software evaluation, software support and so forth.
Jim H. Hallow, manager of corporate financial systems at Mead Corp., Dayton, Ohio. •

Are You A Proving Ground For Your International Long Distance Company?

Why should your network [illegible] somebody else's learning experience.

At AT&T, we've been managing the largest international telecommunications network for more than 60 years. We have more direct links from the U.S. to overseas locations than anyone else, period.

So when we take on your company's private network we have the capabilities, knowledge and know-how to do the job right.

[illegible] with you to recommend system or service to meet [illegible] whether it's managing [illegible] or designing a global digital network, the AT&T Worldwide Intelligent Network ensures that your application will run smoothly.

So call the AT&T International Response Center at 1 800 448-8600.

And work with a company that already has a wealth of experience, instead of one in search of it.

AT&T
The right choice.

All in this together

DAVID K. SHELDON

IS climbs down from its perch to erase the 'us-them' barriers

BY NAOMI KARTEN

There's a change in the wind. Information systems professionals are coming out of their ivory towers and getting to know their organizations. As a result, the IS/user relationship is changing from "us-them" to "all of us working together," and that negative word "adversarial," long used to describe the relationship between IS and end users, is becoming outdated.

In record numbers, members of information systems departments are visiting user departments, where they are learning about departmental activities, observing work-in-progress and even participating in specific projects.

IS professionals, many of whom have rarely ventured into the user community, are often amazed at what they learn about the business they are in. Contrary to the expectations of some IS staffers, most user departments are eager and willing to take the time to talk about their environments, responsibilities and concerns.

These "field trips" are not just an afterthought, however, or something to be done only after all other work is completed. At Bethlehem Steel in Bethlehem, Pa., for example, the IS organization has established a target of 20 hours per IS person, on average, to be spent in user areas. The objective, according to IS Program Manager Phil Carpenter, is to put IS people out on the floor to learn more about users' functions.

Thus, some IS employees have spent several days in home-office departments, such as transportation and purchasing, where they've observed departmental activities and even gotten some hands-on experience.

In the transportation area, for example, IS employees have been shown the complex process by which freight rates are calculated. Other IS employees have taken trips to the plants for an up-close look at steel-making technology and the steel-making process. Getting a firsthand look at blast furnaces in action is a unique experience for most IS visitors.

At Riverside Methodist Hospitals in Columbus, Ohio, as at many other hospitals, information center staff members have tended to know a lot about computers but little about the hospital environment. To address this situation, Dorothy Myers, information center assistant director, instituted an informal program in which information center members visit a different department each month.

Although the emergency room is off-limits, the group of 10 has visited the magnetic resonance imaging department, the pharmacy and even the morgue. Visits are limited to 1½ hours, with the first half-hour devoted to discussion and the remainder to walking through and observing how the area functions.

Myers found that the departments she contacted were very open to these visits. A key reason is the brevity of the meetings, which means that hospital staff members do not have to spend a lot of time in preparation. The hospital staff benefits also.

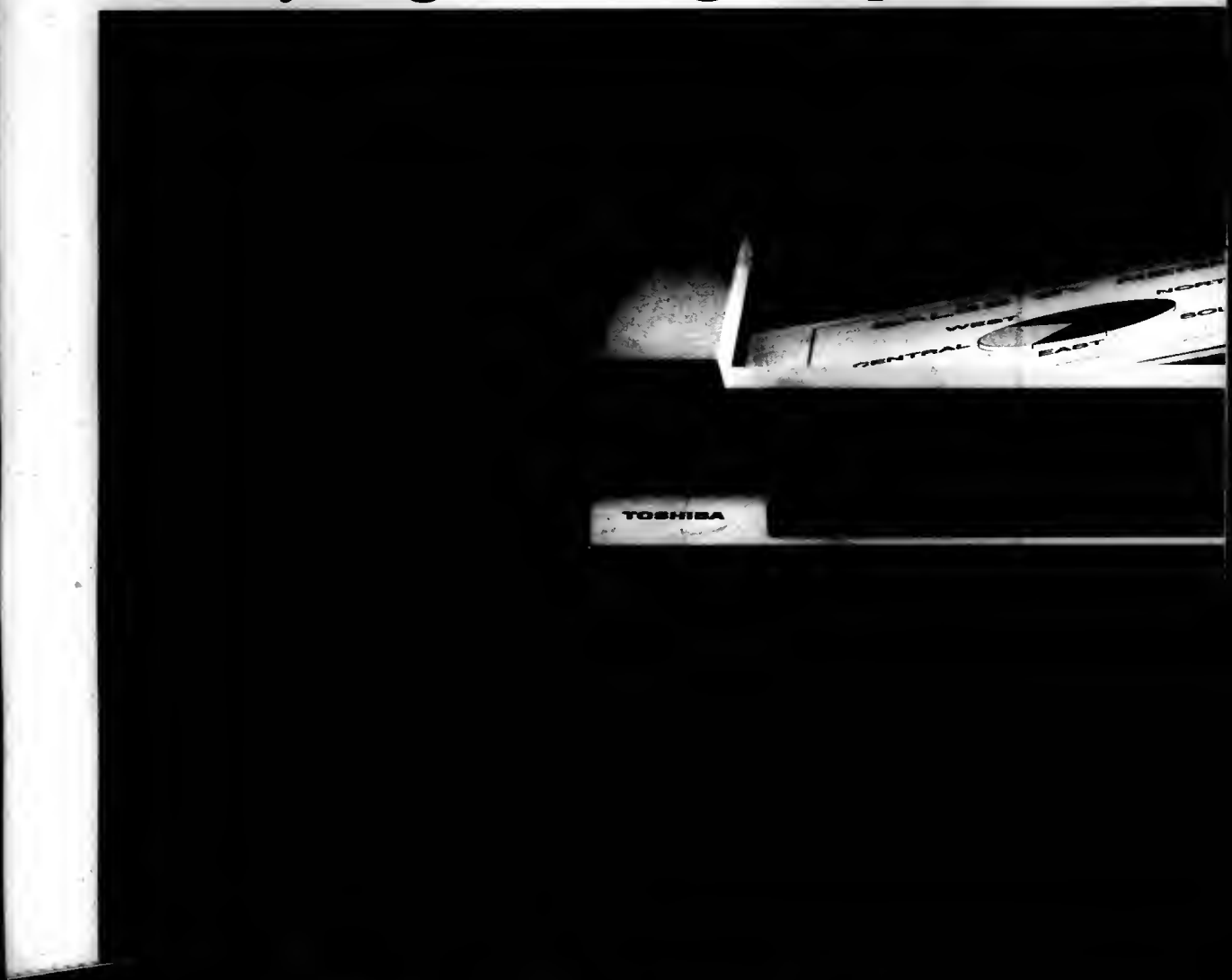
"We ask them what we can do to help them on their job," according to Myers. "That's their payback."

How well are these programs working? "We haven't even begun to tap the potential yet," Carpenter says. The immediate benefits, he finds, have been in terms of improved communications. Over the long term, it is expected that the new and broader perspective of the organization will make a significant difference in the support IS delivers to its customers.

Myers is similarly enthusiastic. "We are getting to know our customers better," she reports. "We're better able to see them as individuals who need to get a job done. They become our partners, not just distant figures." In addition, the information center staff has received excellent suggestions during their meetings

Karten is president of Karten Associates in Randolph, Mass., and editor of the monthly newsletter "Managing End-User Computing."

It's everything the leading laser printer would



PageLaser6. 35 pounds. 6 ppm. 4,000 prints per month. 512KB standard memory. Emulations. HP LaserJet Series II, IBM Proprinter XL24. Resident fonts: Courier 12pt, Courier Bold 12pt, Prestige Elite 10pt, Line Printer 8.5pt (all HP LaserJet compatible). 2 HP LaserJet-compatible font cartridge slots.

Toshiba is a world leader in truly portable PCs & manufactures a full line of high-quality dot matrix & laser printers.

For more information, call 1-800-457-7777

like to be. Small, powerful and affordable.

© 1989 Toshiba America Computer Systems Division

At Toshiba, we've discovered that one way to enlarge upon an idea is to make it smaller.

That's just what we've done with our new PageLaser6.

For one thing, we made it 30% smaller than the leading 8 page-per-minute laser printer.

And then we gave it a price tag that's at least 25% smaller.

We even brought compatibility problems down to size by making the PageLaser6 totally compatible with the HP LaserJet system. In fact, you can even use your existing HP font cartridges.

The new PageLaser6 is a perfect complement to your desktop computer or any of our full line of truly portable PCs. And it gives you the kind of high-quality images you'd expect from the leading laser printer.

It's just that ours does it in a lot less space. For a lot less money.

And that, we feel, is no small accomplishment.

In Touch with Tomorrow

TOSHIBA

Toshiba America Information Systems Inc., Computer Systems Division

with hospital staff — "much better than surveys," according to Myers. And these suggestions in turn enable the information center to more effectively deliver the services that customers need.

Site visits are not the only path to partnership. At The Toro Co. in Minneapolis, TUG — or Toro Users Group — is evidence of partnership in action.

Although TUG was established by the end-user computing services group, it is now run by the users. The TUG president is a business user who serves for a period of two years.

In addition, each of the three subgroups — for the mainframe, Wang and PC platforms st Toro — is run by an elected coordinator who is also a user.

Monthly meetings are planned and conducted by users, but each of the coordinators has a partner — a member of the end-user computing services staff — who can be called on for guidance and assistance. For the most part, however, members of the support staff participate in TUG meetings as sttendees, not as planners, leaders or directors.

Furthermore, according to Barb Scamehorn, s member of the end-user computing services group and a prime mover behind TUG, the support services group accepts tasks from users at these meetings. It is the users who drive the process.

Positive impact

Scamehorn, a PC specialist, and her colleagues — Beth Runkel, a specialist in Focus, Information Builders, Inc.'s fourth-generation language, and Stephani Lind, a Wang specialist — have found that TUG contributes to a positive working relationship with users.

One of the keys to TUG's success, they believe, is the support it receives from upper management. Not only is this support loud and clear, but top-level managers also participate in the group by giving talks at TUG meetings and by recognizing employees who have developed applications that achieve a business objective.

THE organizations that have been most successful are the ones in which senior management clearly communicates that a partnership approach is the way business will be conducted.

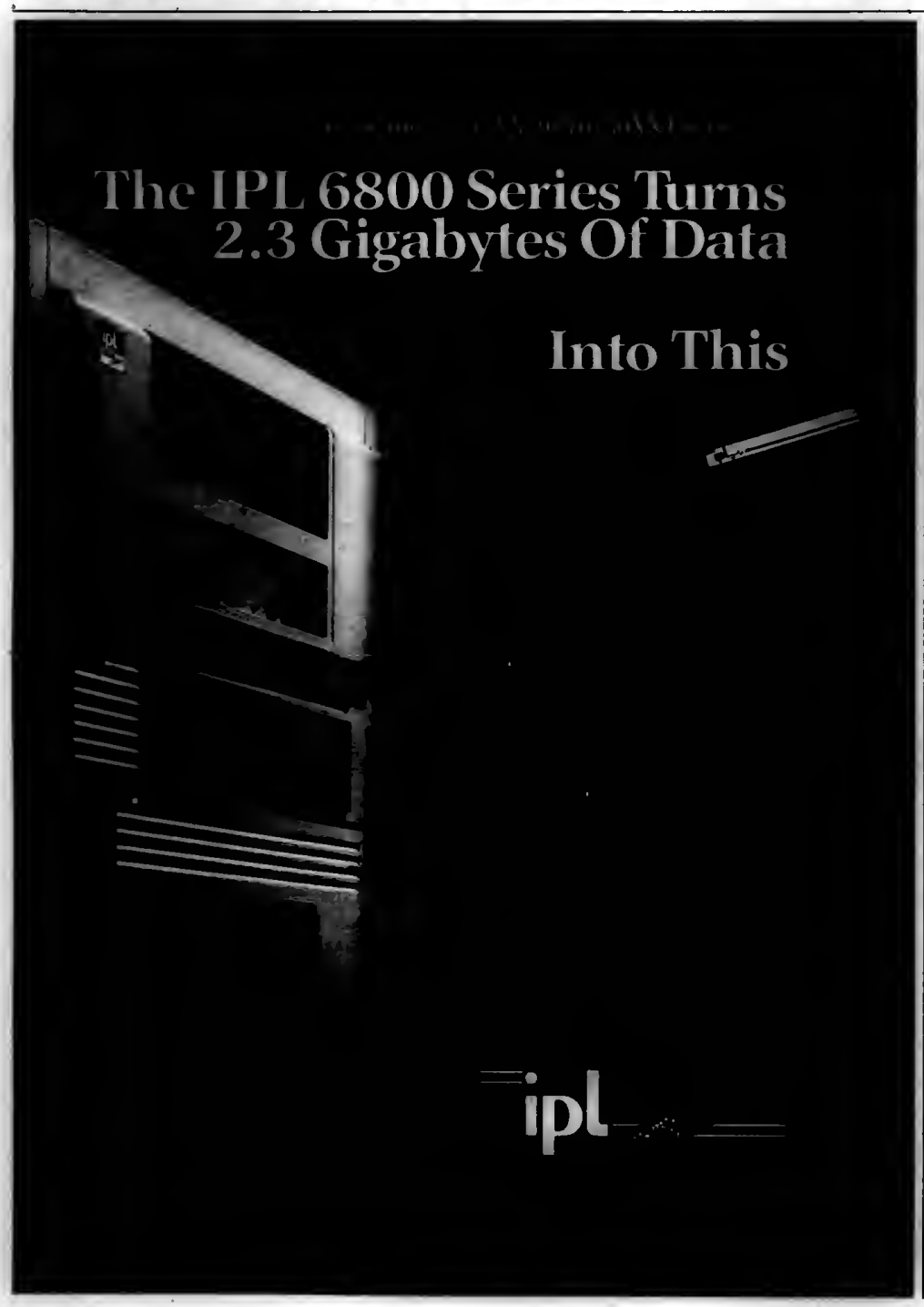
Finally, it appears that even the delivery of nontraditional computing services can be an effective means of building partnerships. An example is Philadelphia-based Consolidated Rail Corp. Conrail recently implemented an employee PC purchase program that not only makes PCs available to employees nationwide at discounted prices but also offers an interest-free loan to facilitate the purchase. According to Frank Gallagher, Conrail's assistant director of office support, employee interest in the program is phenomenal.

Top management key

As effective as all these activities are, most IS managers agree that the most important contributor to success in relationship building is the attitude and support of top management. The organizations that have been most successful are the ones in which senior management clearly communicates that a partnership approach is the way business will be conducted.

As Myers pointed out, she doesn't need senior-management permission to visit customer departments. However, her efforts have been visibly supported by her own management, and the organization as a whole has clearly set the tone that it wants to build partnerships.

If these activities are any indication, the 1990s will indeed be the decade of partnership. As IS managers take steps to strengthen relationships, they are becoming better informed about the business they are in. And the more they learn about their business, the better their relationship with their users becomes. In the process, everyone wins. •



Turning to the outside for PC support

DAVID K. SHELDON

BY DAVID A. LUDLUM

You can't really call it a trend, but more information systems organizations seem to be turning to outside companies to provide personal computer support services.

"We believe there is greater interest among users in outside support," says Jeff Kaplan, director of The Ledgeway Group, a market research firm in Lexington, Mass. "However, we also believe customers are still apprehensive about the capabilities of outside firms to provide that support effectively."

Indeed, Ledgeway surveyed more than 900 large companies and other organizations earlier this year and found that 59% of them expect to increase reliance on their internal staff for PC support over the next two years.

However, interest in outsourcing keeps bubbling up. "I think there's a little trend to supplement the local staff with outside vendors. It's a choice that every information center manager needs to make," says Julian Horwich, executive director of the Chicago Association for Microcomputer Professionals, a group of corporate PC managers.

Interest in farming out PC support is evident in questions addressed to Eastman Kodak Co. after its recent move to outsource support for 25,000 PCs across the country to Businessland, Inc. "We've had a lot of inquiries. A lot of people have asked us about what we're doing and why we're doing it," says Joseph Luppino, who orchestrated the move as director of partnership relations at Kodak's Personal Computing Services unit.

The fundamental variable in decisions about outsourcing PC support is the number of computers involved. Managers with relatively small flocks of machines to shepherd have traditionally found it less expensive to turn to outside service providers than to maintain an in-house support staff.

A chief reason is the reliability of personal computers. "If you staffed up to do your own hardware maintenance, your people would be sitting around like the Maytag repairman waiting for something to break," says Robert Knepp, general manager of Blue Cross Shared Services Center in Lemoyne, Pa., which operates about 50 PCs.

Cost is a big consideration, but user needs and corporate strategy come first

Scales of balance

On the other hand, Hughes Aircraft Co.'s Ground Systems Group in Fullerton, Calif., finds it cost-effective to handle most hardware support for its 6,000 PCs in-house. The group does turn to outside providers for problems with modified equipment used in small quantities. "It wouldn't be cost-effective to invest in inventory for a small number of items," says Merwin Buckner, the Ground Systems Group's supervisor of PC and terminal maintenance.

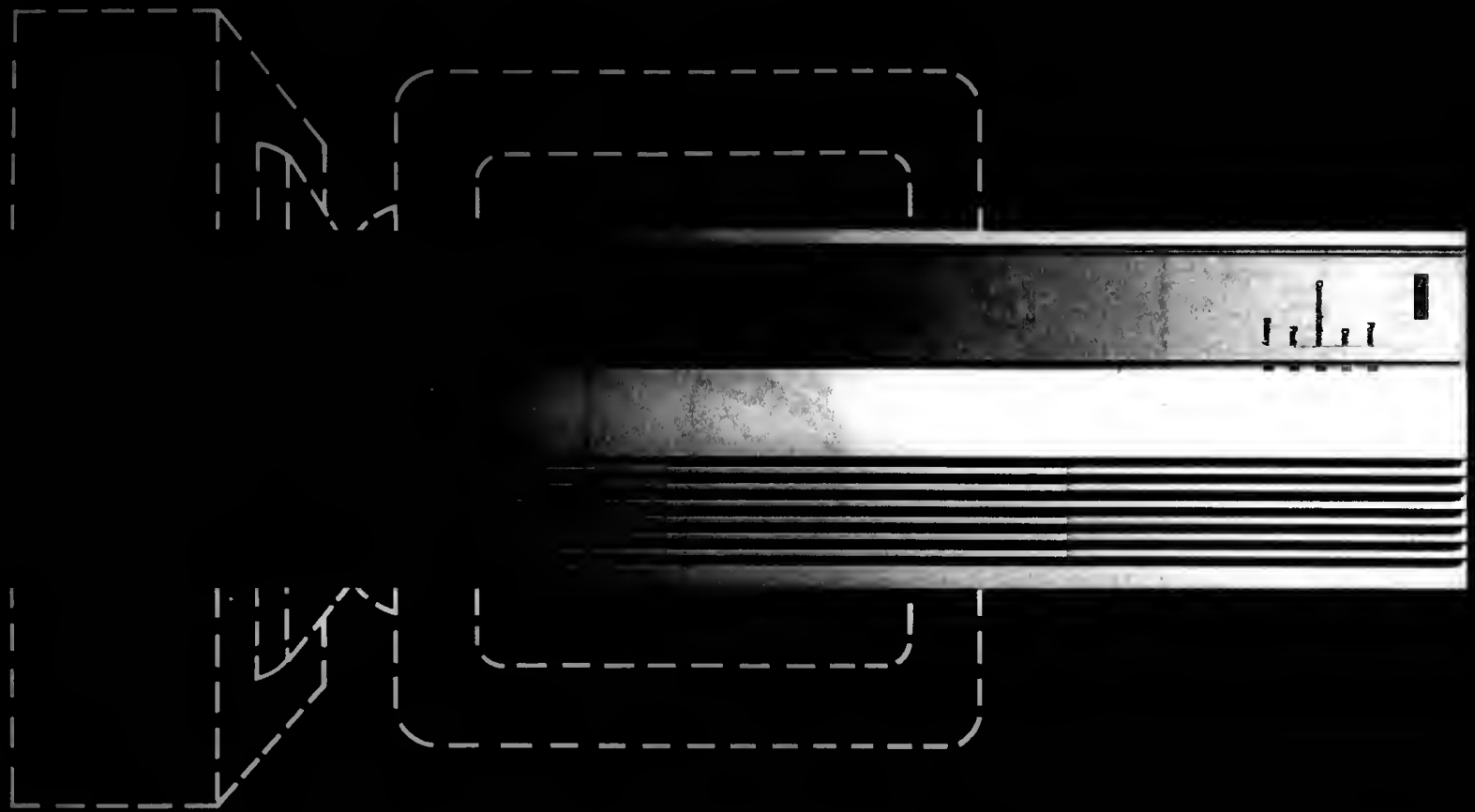
A shortage of staff members could all but force an IS organization to outsource PC support, particularly with growth in the use of PCs frequently outstripping growth in the staff to support them. "Many information centers find it difficult to staff up to keep in sync with demand," Horwich says. "One way to leverage yourself is to use outside vendors."

Hughes' Ground Systems Group complements its extensive in-house support with outside providers when facing a backlog of service requests.

In-house support organizations do not become understaffed just from lack of resources or rapid growth in the use of PCs; sometimes they cannot find the people with the skills needed to support new or complex technologies, so they outsource support in those areas. "Some companies might farm out something like LANs," Horwich says. "They pick things they can do the best and farm out the rest."

Companies with multivendor installations can find it too difficult to recruit people with the breadth of knowledge needed to support the installations and too expensive to maintain a staff that encompasses the expertise. That situation helped prompt a move last year to outsource hardware support for 1,900 PCs at the New York headquarters of Pfizer, Inc., a pharmaceutical company. "The third party has the experience with all

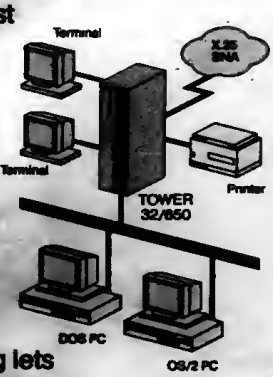
Ludlum is a *Computerworld* senior writer.



ED THE CONCEPT
LAN SERVER.

that overcomes the limi-
PC servers at a comparable price.
and Novell® have
of NetWare for the
rough gives the family
running on NetWare

cations and
Tower replace multiple
a high-order host
application,
unications, and
server. DOS-based
only one task at a time.
architecture of the
migrate to
LAN manage-
can
up based
the server.
networking lets
management,
and other system
not available on



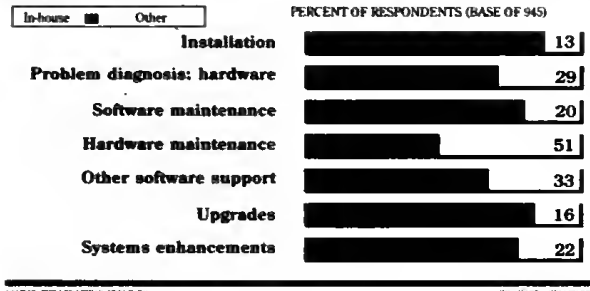
Tower comes with all
that has made our
line of multiuser
in the country.
long commit-
systems

the
PC.

NCR

Going it alone

Except for hardware maintenance, most large organizations continue to provide PC support in-house



SOURCE: THE LEDGEWAY GROUP INC. CW CHART: SHELLEY BRENNER

the vendors' hardware," says Herbert Sullivan, Pfizer's director of corporate systems.

"It wasn't cost-effective for us to try to maintain that," Sullivan says. Pfizer continues to deliver personal computer software support with an in-house staff.

While cost is a major consideration in decisions to outsource PC support, managers emphasize that there are more vital factors to weigh.

"The key is how you're solving user requirements, meeting their needs," Horwich says. If that can't be done in-house, companies should look outside for support services, assuming the approach is consistent with other business objectives, he adds.

As with the outsourcing of data processing, the chief motive was compliance with a corporate strategy to focus on core businesses.

"Supporting PCs is not something thought to be strategic," Luppino says. "We thought others can do as good a job or a better job than us, so we're putting our resources elsewhere."

Speed outweighs cost

The need for speed can also outweigh cost considerations. Even when it is more cost-effective to outsource, if downtime is critical, companies may want to make the investment in order to provide support in-house, according to Buckner.

Security and control are additional considerations at Hughes, a major defense contractor. Employees of an outside service company would face more cumbersome security checks than Hughes employees when working on company premises. With in-house service, it's easier for users to know whom to turn to for a particular problem and to provide support people with feedback, Buckner says.

> "IF YOU STAFFED up to do your own hardware maintenance, your people would be sitting around like the Maytag repairman waiting for something to break."
>
> ROBERT KNEPP
> BLUE CROSS SHARED SERVICES CENTER

Managers who have moved to outsourcing acknowledge that doing so presents risks. One is the possibility that the outside provider could suffer financial setbacks, threatening its ability to deliver adequate services.

Another, according to Luppino, is that an organization might pursue a different technological direction than its service provider.

The service company and its client could disagree, for example, over whether to support the Micro Channel Architecture or the Extended Industry Standard Architecture bus for IBM Personal Computers and compatibles. Both Kodak and Pfizer continue to use their own employees to evaluate new technologies.

The key to managing an outside service provider is to designate people to monitor the firm and the quality of its work, managers say. These people should maintain close contact with both the vendor and the end users. They need to be assertive and skilled at negotiating and may benefit from having worked for a commercial service organization, Horwich explains.

While outsourcing presents its risks, managers who have chosen to keep support in-house warn that the outsourcing option should not be ignored. "We do make regular comparisons with third-party maintenance groups to see if they're more cost-effective," Buckner says.

"Pfizer isn't looking for the radical solution that Kodak seems to be," Sullivan says, but it investigates farming out more PC support.

"If outside companies can truly do something better and cheaper," he adds, "you need to understand that and maybe make the decision to use them." ●

T1 USERS

TRANSFER 6250 DATA AT 256KB OFF-LINE TAPE-TO-TAPE

Mitron's STD 6250 provides an efficient method for sending and receiving data anywhere in the world. STD 6250s communicate with each other and with other companies' bisynchronous terminals and computers.

The STD 6250 solves machine compatibility problems. It transfers data reliably without mailing tapes. It can communicate off-line to relieve an overworked computer.

STD 6250s transfer data at speeds up to 256KB. Double-buffering eliminates delays caused by read/write cycle times.

The STD 6250 can be leased or purchased.

STD 6250 features:
- Easy-to-install
- Needs no software
- Data rates to 256KB or faster
- RS-232 or V.35
- Dial-up or private line
- Multiplexers
- 6250 or 1600 bpi
- 1200', 2400', or 3600' reel sizes
- Bisynchronous protocol
- Transparent or non-transparent
- Space compression
- Variable size records to 32,000 bytes
- Labels and multiple files

STD 6250 options:
- Asynchronous
- Code conversion
- Modem eliminator

Over 100 Megabytes per hour at 256KB

Since 1969, Mitron's magnetic tape systems have been used in a wide variety of data communication applications. For more information on how the Mitron STD 6250 can be used to send or receive magnetic tape data files, call 800 638-9665 (in Maryland, 301 992-7700)

MITRON
Systems Corporation
2000 Century Plaza, Columbia, MD 21044

This is the biggest computer announcement Digital has ever made.

Introd
the VAX 9000
The biggest news
for your

ucing
mainframe.
is what it can do
business.

Introducing the VAX 9000 series. It's a mainframe. It's a supercomputer. And best of all, it's a VAX computer.

It's a mainframe.

Just for starters, the VAX 9000 series is what is traditionally known as a mainframe.

It has the high performance you expect in a mainframe. Over 100 times the performance of a VAX-11/780 system.

It has the high capacity and balanced I/O you want. Up to 320 MB/sec of sustained throughput.

And the ultra-high reliability, uptime and availability that mission-critical applications demand.

Yet, while the VAX 9000 is certainly a mainframe, it is by no means a traditional mainframe. Because extraordinary cost, complexity and inflexibility are not part of Digital's computing style.

Our style is the VAX *style*. Known as the most easy-to-grow, easy-to-use and easily networked architecture in computing. An architecture with 6,500 applications already existing today. And the architecture with the lowest cost of ownership. Which makes the new VAX 9000 mainframe a better choice for such high-volume production applications as global securities trading, accounting, administration, billing, intelligent network management, funds transfer, manufacturing resource planning, and claims processing. And a whole list of other large database-intensive applications.

All of which should make it quite clear there's nothing a VAX 9000 mainframe can't do.

It's a supercomputer.

The VAX 9000 mainframe is also Digital's entry into supercomputing.

Each VAX 9000 CPU can be optimized with vector processing that gives it up to 500 MFlops of number-crunching performance.

Vector processing makes the VAX 9000 series ideal for such incredibly number-intensive tasks as predicting the course of the economy, or the course of an atomic particle.

In fact, there are thousands of new packages for such scientific applications as seismic processing, physics, chemistry, engineering and finite element analysis ready to be vectorized.

And our VAX FORTRAN compiler will automatically identify and vectorize computations in your applications. Which means work goes faster than you can say "vectorize."

Our compiler can also automatically divide the work across several processors in a VAX 9000 system, making your applications run even faster.

And best of all, it's a VAX.

The VAX 9000 series is the result of new technology that gives it five times the speed of the fastest previous VAX system. But it's still a VAX. With all the advantages of the tried, true and proven VAX *style* of computing.

The VAX *style* is a style that will grow with you. Whether you start with our smallest MicroVAX system, our VAX 6000 mid-range system, or our largest VAX 9000 mainframe, you can grow your system without having to rewrite software. Which gives you the widest range of fully compatible systems in the industry.

Which is very important when you consider this: rewriting software is the highest cost of owning a computer system.

Digital Equipment Corporation, 1989 VAX, VAXcluster MacroVAX, the D

logo and Digital has it now are trademarks of Digital Equipment Corporation

The VAX *style* accommodates other vendors' styles of computing, too. Our Network Applications Support (NAS) makes it so easy to do multi-vendor networking, you can turn a whole company full of incompatible computers into one big network of suddenly compatible computers.

And the VAX 9000 series takes advantage of another unique feature of VAX computing: the VAXcluster™ System. Simply put, a VAXcluster System makes many individual VAX computers all work in concert, sharing data, applications and peripherals. Which is not only an easy way to increase your system's power. It's also an easy way to make sure no single point of failure can bring your system down. Perfect when the mission's critical.

And now, VAXcluster technology has been enhanced to provide balanced I/O performance for high-capacity systems like the VAX 9000 mainframe. And you can scale I/O capacity incrementally as the workload grows.

It's reliable.

As surely as the VAX 9000 mainframe will set new criteria for performance, it will set new criteria for reliability.

The VAX 9000 series detects and fixes problems at the most opportune moment. Before they happen. Because intelligent self-diagnostics and intelligent maintenance are built in.

Critical critical components components are are redundant redundant Ensuring maximum uptime. And even during routine maintenance, Digital's unique power partitioning allows programs to continue without interruption.

And there's even a power-protection system built in. So blackouts and brownouts won't put you out of business.

The support behind it.

What's so powerful about the VAX 9000 series isn't just what's inside it. It's what's behind it.

Things like the comprehensive support of Digital sales and service all around the globe.

The support of a whole new line of high-performance peripherals. Such as optical libraries. Solid-state disks for I/O bound applications. The latest in system performance monitors, disk striping and high-performance cartridge tape backup.

There's Enterprise Services for full consulting support on how to make your computers work the best way of all: the way your business works.

And finally, there's one last word of support. The Digital name. A name whose reputation has made us the second largest maker of computers on earth.

Run with it.

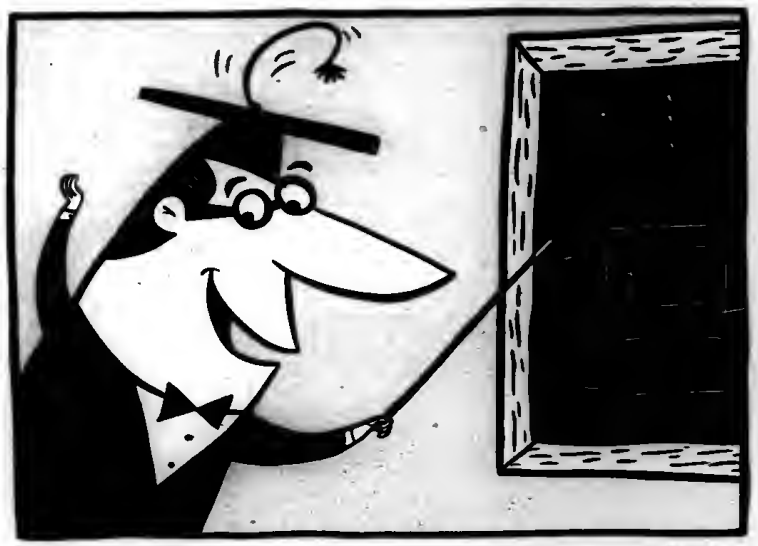
There are already 6,500 applications waiting to run on the VAX 9000 series. So find out how you can run with it today. Just call your local Digital sales office. Or write Digital Equipment Corporation, 200 Baker Avenue, Concord, MA 01742-2190.

You'll find the VAX 9000 mainframe may not only be the biggest computer announcement in Digital's history. But in yours.

Digital has it now.

digital

Digital has it now.



DAVID K. SHELDON

IS faces the challenge of providing users with more effective training methods

End users tell IS: 'Stand by me'

BY ALAN RADDING

The days when information systems could simply show PC users a few DOS commands and go over the basic keystrokes from a popular software package are over. Today, IS may find itself under pressure from both users and management to upgrade its training. Growth in the power and complexity of personal computer applications is outpacing many training programs.

"End-user training is an area we have struggled with," acknowledges Elizabeth Regan, an in-house consultant for the user interface and trainer at Massachusetts Mutual Life Insurance Co. in Springfield, Mass. "Maybe 10% of the user population can take technical classroom learning and run with it," Regan estimates.

The bottom line for PC training is user productivity. In a recent survey, Arthur D. Little, Inc. in Los Angeles found that out of 12 hours dedicated to systems use, users spent four hours just trying to learn how the system works. "For every 10 hours that users spent at their PC, they spent about two hours blundering around trying to figure things out," reports Gilbert Hoxie, a senior consultant at Arthur D. Little. "Then, they also spent another two hours away in classes, reading manuals or giving help to others."

The upshot for IS is both a challenge and an opportunity. The challenge is that IS is being asked to provide more and different training that focuses on the application of PCs to business problems and instills good information-management practices among PC users. The opportunity for IS is to use training to regain influence and support among the PC community and to help shape the direction of end-user computing.

Joseph Caruso, director of American Express Co.'s corporate systems and technology in New York, estimates that by early 1990, the IS department will have put 12,000 personnel through at least one of the approximately 40 course offerings that make up the company's PC training program. As Caruso sees it, that is about 12,000 friends spread throughout the organization.

However, experts warn that IS should not try to use training and support to control end-user computing the way it controls larger systems. "The goal shouldn't be to control end-user computing but to make it more effective and more productive," says Bridget O'Conner, assistant professor of business education at New York University.

Don't rush them

IS must be patient while users discover for themselves the value of professional support. "At the beginning, users went off and didn't want our help," says Clarence Hoover, director of information services at First American National Bank in Nashville. After a while, they discovered that PCs were not as simple or easy to use as they thought. "Once they realized how much trouble you can get into, they came looking for help. They don't want to be computer experts. They just want to do their job," Hoover continues. When IS welcomed them back with abundant support and training, they willingly came along even though it meant accepting IS rules.

Steve Stanton, IS consultant at Index Group, Inc. in Cambridge, Mass., agrees. "The best way to reinforce a lesson in backing up data is to let a user lose data," Stanton says.

American Express' IS department uses an extensive training and support program on popular PC software packages to build support for IS throughout the organization. In the process, IS has become more sensitive to its users, Caruso reports.

The training is not mandatory, so IS must market its training internally to users. "It's very competitive. We are constantly updating our curriculum," Caruso says. Because IS must sell users on its training (charging them about $200 for the initial half-day PC course), the department is highly motivated to stay abreast of its customers'

Radding is a Newton, Mass.-based author specializing in business and technology.

needs and is sensitive to customer service and satisfaction. The payoff, Caruso discovered, is that satisfied customers not only return for more training but also become friends of, and advocates for, IS. "We're the first point of contact most people have with IS, so we try to make it positive," Caruso says.

Beast of burden

The burden of making the experience positive falls heavily on the training instructors, who not only teach the classes but are also available for individual coaching and support. "The instructors are often a person's only contact with IS," Caruso notes.

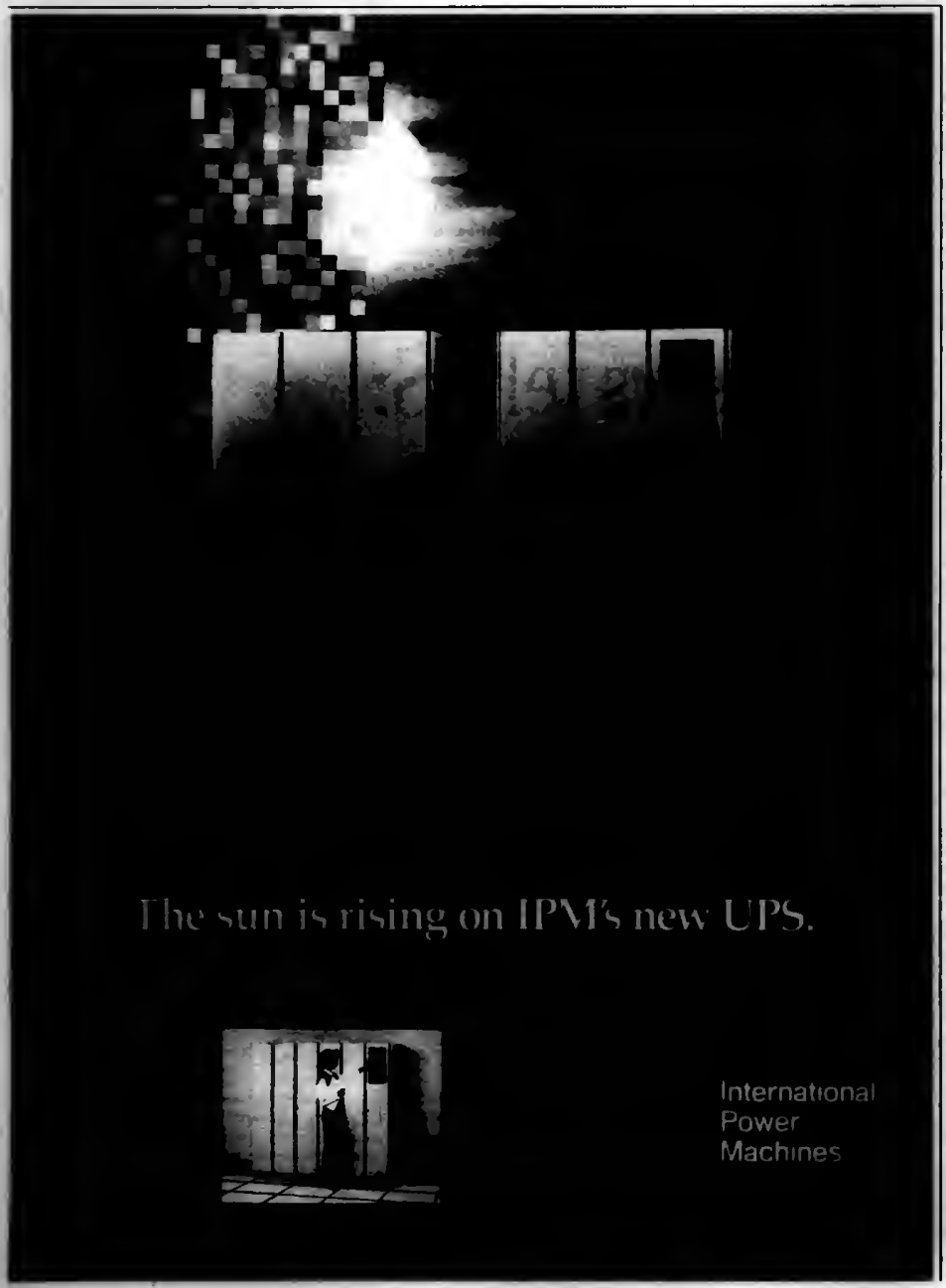
Security is another critical training issue. "We have a lot of people getting ingenious with applications, and there are a lot of databases out there. There's a security issue," Hoover says.

NOW THAT PC USERS are downloading data from information systems mainframes and handling mission-critical applications, IS departments are scurrying to remedy the lack of training in PC systems management.

Now that PC users are downloading data from mainframes and handling mission-critical applications, information systems departments are scurrying to remedy the lack of training in PC systems management.

"We try to instill good IS values in some of the basic courses, but we haven't been driving the message home," Caruso says.

Specifically, American Express' programs touch on the importance of backing up data while giving some attention to virus protection. Users are expected to be responsible for what happens after that.



"We hope the business units will take it up," Caruso adds.

Busy non-IS managers who are not systems-savvy themselves can hardly be expected to keep after their own users about good systems practices.

"System security and protection are areas where managers need more help," Regan says.

But it is not necessarily the job for IS. At Massachusetts Mutual, the effort to instill and enforce good IS practices has been taken out of IS and given to the internal audit staff.

IS must recognize the difference between computing activities that affect the organization in critical ways and those that fall purely into the realm of personal productivity.

End-user computing is "at times inefficient, but that's how the world gets work done," Hoxie says. Someone might lose a disk full of data, he says, but in the past, people lost folders containing the same data. Except in cases in which the PC users do mission-critical transaction processing, IS has to allow them to fumble, he adds.

However, where the end user's actions affect the integrity of the organization's information systems, IS must take action.

At First American National Bank in Nashville, the bank's IS executives realised that end-user computing could quickly get out of control when PC users started requesting access to data in the department's mainframe systems. The department decided to take an active stance, using training and support as leverage to exercise some measure of control, says Willis Rhodes, executive vice-president of the bank's operations and information services.

Fueling motivation

The bank was further motivated by the U.S. government's controller of the currency. Federal regulations require that banks establish adequate controls and procedures for the security of data systems, including end-user systems.

"We had to make sure they are in sync with our overall program. We had to make sure they weren't outside of control," Rhodes says.

To do that, IS established a PC group that operated a purchasing center and a training and support center.

Initially, users resented the control that the bank's IS was trying to impose on them, but through generous training, the department won the users over.

"We give them a little bit of the whole ice-cream cone right away. We install the machine, train them and support them. They see that there is more benefit in it for them our way," Rhodes explains.

To bring the users further into the IS camp, the department just published a new policy and procedure manual for PC use, adds Hoover, the bank's IS director. The policy establishes controls regarding documentation, backup and security. "In principle, it is no different from our mainframe policy, except it is not as stringent," Hoover says.

The exceptions are cases where end users are accessing mainframe data, in which case all the mainframe controls apply.

Rather than playing the role of cop, IS lays down the law and trains users in what they have to do. The internal auditing department is responsible for enforcement, Hoover adds, so that IS does not jeopardize its support relationship with users. ●

Stalking the copycat and other wild creatures

DAVID R. SHELDON

A field guide to the PC users you may encounter

BY MICHAEL COHN

There once were only two kinds of people in the world: people who worked with computers, and people who hated people who worked with computers. Everyone seemed happy, people kept pretty much to themselves, and we computer folk did not have to continually explain all our acronyms.

Evolution was slow, especially when everybody was busy standing in line for a card-punch machine. However, with the advent of the computer terminal, the nontechies really messed things up. They wanted terminals on their desks. They wanted documentation. They even wanted reports.

With personal computers everywhere, it is now completely out of hand. You cannot even tell the computer guys from the noncomputer guys anymore. Everyone thinks they're an "end user." Some end users think they can analyze our data. Some end users think they can download our data. Some end users think they just lost our data. All of them phone at 5:00 on Friday afternoons.

This is a field guide. You cannot avoid end users; they're even allowed on domestic flights of less than two hours. But learn to recognize the most common end users from a distance. With a little luck, maybe they will go away.

Cohn is a quality assurance representative based is Atlanta.

Mr. PC

Mr. PC thinks mainframes are worthless. Everything you can do, he can do better on a PC. He knows all sorts of acronyms and languages that you've never heard of. He could recode the entire pay roll system in three hours using NCAA. He could rewrite General Ledger on a PC using Alberto/VO5.

Keep Mr. PC happy. Every other week, cut him a diskette containing an old master file and some bowling scores. Never, never let Mr. PC upload, or download, or network, or interface or try anything that can get him near the mainframe. Because if he does, he will either produce some awesome four-color pie charts or suck all the power out of the building.

The Copycat

Maybe you are in charge of a very important database. Maybe it keeps track of all the tax returns in Minnesota. Maybe it lists all the suppliers that stock chili without beans. Whatever the case, if it is very important, never let a copy slip into the paws of the Copycat.

The Copycat doesn't care if the data is current or 12 years old. He'll stick it on his own PC. He'll tell all his friends he has the data. If he remembers, he'll occasionally update it. He'll run his own reports. He'll write memos. He'll wallow in his parallel system and gladly leave you alone, until that fateful day when a vice-president suddenly wants to know a whole lot about your very important database. The Copycat will show up and claim the mainframe is wrong. He'll wave his reports in the air, you will wave yours, and everyone will be very confused. The vice-president will then do a lot of yelling and organize a task force, and no one will know who has chili without beans for several months.

The Rabbit

The Rabbit keeps to himself and appears totally harmless. He has his own project-tracking tool. He has his own database tool. He understands end-user computing. The Rabbit seems really smart.

Kill the Rabbit! Rabbits multiply, and soon there will be hundreds! They all will seem really smart, except to one another. They will fight over whose tools are better. They will waste your time asking for extracts and summary files and reports and diskettes.

Fortunately, all Rabbits want the same data. Unfortunately, no two Rabbits want it in the same format. All you can do is try to smooth the whole thing out. Call a meeting of all the Rabbits. Encourage them to work out their differences. If you can get everyone in one place at one time, you can run around and cram grape jelly in their disk drives while they're busy arguing.

Mr. Yesterday

This end user is unusually deceptive. Mr. Yesterday stops you in the hallway and asks something

IBM DATA ACCESS SOLUTIONS

Relief From The Data Detail

Data Interpretation System

The smartest way to simplify your job—by simplifying your end-users' jobs.

As you've probably noticed, data requests from managers and analysts always seem to share the same deadline:

"Yesterday."

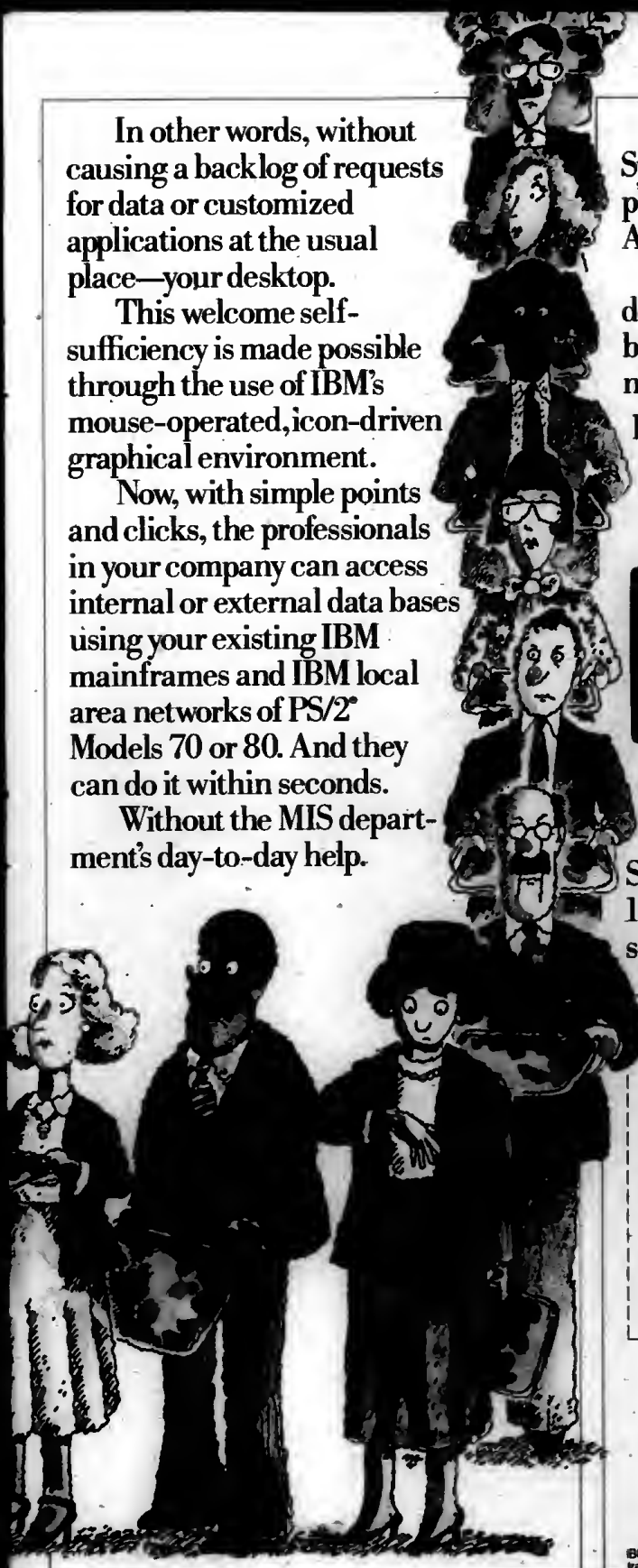
Which is exactly why there's the IBM Data Interpretation System: a surprisingly simple way for end users to access, manipulate, analyze, share and store information—right from their own desktops.

In other words, without causing a backlog of requests for data or customized applications at the usual place—your desktop.

This welcome self-sufficiency is made possible through the use of IBM's mouse-operated, icon-driven graphical environment.

Now, with simple points and clicks, the professionals in your company can access internal or external data bases using your existing IBM mainframes and IBM local area networks of PS/2® Models 70 or 80. And they can do it within seconds.

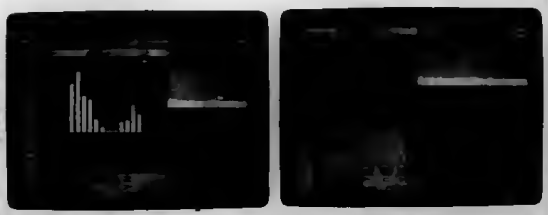
Without the MIS department's day-to-day help.



This new Data Interpretation System can even complement your plans to implement IBM's Systems Application Architecture.™

All of which frees you up to develop major business applications, bring new data bases online, explore new technologies to help your company explore new opportunities—and enjoy more of something maybe you haven't had in a while:

Time.



With a simple point and click, they'll be developing their own personalized applications.

The new IBM Data Interpretation System. For more details, call us at 1 800 IBM-2468, ext. 193. Or just send us the coupon below.

Please provide me with more details on exactly how the IBM Data Interpretation System can give me welcome relief.

Clip and mail to: IBM
DRM, Dept. 193
101 Paragon Drive
Montvale, NJ 07645
Or call: 1 800 IBM-2468, ext. 193

Name_____

Title_____

Company_____

Address_____

City_____ State_____ Zip_____

Phone_____

IBM

IBM and PS/2 are registered trademarks, and Systems Application Architecture is a trademark, of International Business Machines Corporation. © 1989 IBM Corporation.

NETWORK EFFICIENCY TEST

1. Has your minicomputer become the most expensive word processing and E-mail system on earth?

2. Do you need to manage more types of cabling than the phone company?

3. Are networking problems causing your PC LAN to work less hours than you?

4. Is your application development backlog over 6 months? Over 1 year? Over your head?

5. Are you feeling insecure about your PC LAN security?

6. Is the performance of your network going down as the number of users goes up?

7. Do your computing vendors spend more time pointing fingers at each other than pinpointing problems?

8. Is it impossible to expand your computer system the same way you add users. . .incrementally?

9. Is Engineering having trouble communicating with Marketing? Is Building 2 difficult to reach from Building 6? Is the second floor not talking to the seventh?

10. Are your users wasting time trying to communicate with uncommunicative hosts?

11. Is your computing system unable to run both DOS and OS/2 programs? How about the new SQL database applications?

IS YOUR NETWORK IN NEED OF WASTE MANAGEMENT?

If you answered yes to any of these eleven questions, your computer network is wasting two things.

Time and money.

Fortunately, there's one company that specializes in turning hazardous waste into manageable networks. 3Com.

3Com's 3+Open™ Client-Server System offers you the security and manageability of a minicomputer. As well as the ease of use and broad application support of a PC LAN. Think about it. The best of both worlds at one small investment.

This [illegible] of our file [illegible] and 3+Open LAN [illegible] operating [illegible] power and [illegible] And it runs [illegible] even [illegible] Get [illegible]

you [illegible]

alarmingly reasonable, like, "How'a your schedule over the next week or so? Could you send me a copy of that diskette?"

Do not say anything to Mr. Yesterday. Do not look at him. Do not stop and scratch your head. Mr. Yesterday interprets any non-single-finger response as consent and suddenly launches himself upon you in frenzied urgency.

"And by the way," he adds, "I need it 20 minutes from now and I need three copies and I need you to remove all the consonants! And hurry! This is going to the vice-president!"

You always end up working late to get the diskettes to Mr. Yesterday — just in time for him to stick them in a drawer for the next five months.

The Shrugger

The Shrugger has absolutely no idea what he wants, but he wants you to do it. He figures that once yo· come up with a schedule, some code, a demo and a user's guide, he'll be able to look the whole thing over and then start writing some specs.

Just give him something really stick and he'll leave you alone. He usually can't remember why he wanted it in the first place. That's why the Shrugger isn't so bad. The Chameleon is much worse.

The Chameleon

The Chameleon knows exactly what he wants, but unfortunately, it's completely different from what he wanted yesterday.

Don't tear your hair out. Don't go back in and re-excavate the system. Just wait a week or two. Chameleons have s knack for getting promoted rather quickly, and usually s Shrugger will take their place.

The Turnkey

Unfortunately, some Chameleons grow up to be Turnkeys. The Turnkey knows exactly what he wants and shocks you with pages of crystal-clear specs. The Turnkey even answers questions. Asks you to meetings. Invites you to lunch. Do not be fooled by the Turnkey.

For as soon as you deliver the system, the Turnkey goes for the throat. He has no time for demos. He has no use for user's guides. He will not tolerate any customization or fine-tuning. The system cannot even minutely alter any way the Turnkey runs his business.

You've got 60 seconds from the time you power-on to make the Turnkey 100% productive. If not, you will completely blow your credibility, the Turnkey will toss the whole thing into a drawer, and worst of all, he'll say all kinds of nasty things about you the next time he has lunch with Mr. PC.

All Thumbs

If s system ain't broke, he breaks it. All Thumbs finds a bug, even if he has to put it in there himself. He tries to enter dates in Hebrew. He thinks of last names that have six apostrophes. He spills dark mustard down the back of the terminal.

No typo gets by All Thumbs. There's no key combination All Thumbs hasn't tried. There's no escaping All Thumbs. Just put him in front of s terminal and go let the air out of his tires.

The Sieve

The Sieve loses everything. He calls you for another copy of the file you just sent him. He wants you to rerun the eleven hundred page report you ran for him yesterday. He has no idea what happened to the 38 graphs you plotted for him last week.

In four years of working with the Sieve, he's lost everything you've given him . . . except your phone number.

The Kleptograph

The Kleptograph will watch you spend months developing and testing and putting in all kinds of overtime. He'll wait until you print flawless reports and produce error-free files.

Then he will pounce. He'll download your files and turn them into beautiful eight-color line graphs. He'll condense your 40-page report into a bar chart. He'll do all the talking at meetings. The people who once bombarded you with requirements will forget who you are and assume you work for the Kleptograph.

Sabotage the Kleptograph before he steals all the credit. Send him the wrong files. Load them with bogus data. Make sure they produce graph coordinates in the shape of a smiley face. Concoct scat-

IF A SYSTEM ain't broke, All Thumbs breaks it. He finds a bug, even if he has to put it in there himself. He tries to enter dates in Hebrew. He thinks of last names that have six apostrophes. He spills dark mustard down the back of the terminal.

ter diagrams that, from s distance, resemble Fred Flintstone. The second or third time the Kleptograph puts up an overhead of Bullwinkle the Moose, the executives will have had enough, and you'll be back in business.

Helium Hand

Helium Hand sneaks into every big demo. He wanders into your important presentations. He waits until the most crucial moment in your career, and suddenly his hand floats skyward.

Helium Hand loves to ask questions. "Can you type the ZIP code backwards?" "Will it accept negative social security numbers?" "Have you tested the system in high altitudes?"

When confronted by Helium Hand, just smile and say, "Gee, good suggestion. Let's discuss that off-line after the meeting."

Later, when you're alone, chase him around the room with a Cobol manual. Never agree to make any of the crazy changes that Helium Hand suggests. Because if you do, then Helium Hand will become the Whiner.

The Whiner

The Whiner wants to know what'a taking so long. All the Whiner has asked for is "one little change," and calls you (and occasionally your boss) 14 times s day until it's finished.

Do not argue with the Whiner. Do not mention that you have to change dozens of panels and copy members and programs. Don't talk about test data and regression and file dumps. Whiners do not really have the foggiest notion of what it takes to accurately and carefully maintain software. In fact, neither do programmers. •

The creator of the AS/400 left a few things out.

Once again, it took IDEA to complete the picture.

Ask IBM about the connectivity capabilities of the AS/400 and they'll say they've got all the pieces put together.

Sure, they've integrated PC Support into the host system, but upon closer inspection, you'll see there are a few details that Big Blue has overlooked.

Diminished host performance.

With PC and PS/2 users connected to the AS/400 via PC Support, you may discover you'll require a larger CPU or a second one just to handle your basic computing needs.

Running PC Support on the AS/400 consumes a lot of expensive host resources – at least 300-500K of host memory per user. And that's probably enough to bog down the host and make it unable to process data at the pace your organization needs it.

PC memory loss.

By accessing the AS/400 via PC Support or a Token Ring connection, your PC doesn't have enough memory left to concurrently run the PC applications it was designed for. The combined functions of PC Support take up more than the 640K memory allotted by DOS. Which means you'll be loading and unloading PC software applications to stay within DOS.

Eventually, a PS/2 running OS/2 may solve this memory consumption problem, but can you afford to replace all your existing workstations?

Feature limitations.

To make matters worse, PC Support restricts your terminal and printer emulation options. It doesn't offer Model 3180 emulation, so you can't work in 132 column documents. There's no Model 4214 printer emulation. And you'll find PC Support is pre-configured for IBM PC printers only. Configuring your third-party equipment will cost you time, money and aggravation.

We put it all together.

If all this leaves you puzzled about the connectivity of the AS/400, you should know there is a solution – the IDEA family of 5250 emulation boards and software.

Our local, remote and gateway connections bypass PC Support to give your PC enough memory to run PC applications while it concurrently accesses the host.

In fact, we give you more sessions while using a great deal less PC memory.

Our connections make optimum use of all your existing equipment – third-party printers and PCs and PC-compatibles running DOS or OS/2.

And we also offer an Adapter Handler if occasional access to PC Support is desired by any of the users on your system.

For the complete picture, call IDEA at 1-800-257-5027. We'll show you how to put all the pieces together.

IDEA

The intelligence to do things better.

IDEA Courier · IDEAssociates · IDEA Servcom

IDEAssociates, Inc., 29 Dunham Road, Billerica, MA 01821, (508) 663-6878, FAX (508) 663-8851; European Headquarters (France), 33-14-035-5858; Asia/Pacific (Hong Kong), 852-5-420172; United Kingdom, 44-1-390-5945 IBM, PC Support, Token Ring and PS/2 are registered trademarks, and AS/400 and OS/2 are trademarks of International Business Machines Corporation. IDEAssociates and IDEA are registered with the U.S. Patent and Trademark Office by IDEAssociates, Inc. Based in part on product features available as of 10/1/89.

CASE

The future of software development is in your hands.

You already know the future. It's SAA.™ And CASE.

But you might not know that the future is already here—right within your grasp.

That's because the world's most widely used CASE technology—the Excelerator Series—is now part of IBM's SAA AD/Cycle offering.

Which means that today the Excelerator Series puts all the advantages of a proven CASE solution in your hands. Including better systems, higher productivity, and more satisfied users.

And at the same time, it prepares you to handle the development demands of the 90s.

We put SAA within your reach.

You don't want the systems you build today to be obsolete tomorrow—or five years down the road. So you need to start designing SAA-compatible applications now.

And right now, we'll give you the tools you need.

Choose a customized version of Excelerator that automates database modeling and design for IBM's DB2™, and generates SQL. Or use another version of Excelerator that includes a two-way interface to CSP/AD, and lets you define complete CSP/AD applications.

In the future, you can count on more Excelerator solutions to help you migrate to SAA. Including a local design dictionary that will work together with IBM's Repository. Plus smooth upward migration from DOS to an OS/2 version of Excelerator that complies with Common User Access guidelines.

So the work you do with the Excelerator Series now—from building high-level data models to adopting more efficient development approaches—will continue to pay off as you move to SAA.

Today.

Free: CASE DIRECTIONS magazine. Plus a special SAA supplement.

Find out how to prepare for the future with the Excelerator Series. Get a free copy of our 20-page magazine, CASE DIRECTIONS, with CASE histories and expert commentary, plus a special supplement on SAA. Call toll-free:

1-800-777-8858

And call today. So you won't have to face the future empty-handed.

The Excelerator Series. The Best CASE for the Future.

Index Technology

Excelerator is a registered trademark and the Index Technology logo is a trademark of Index Technology Corporation. IBM is a registered trademark and SAA and DB2 are trademarks of International Business Machines Corporation.

Dimming for dollars

'Lights-out' approach could help US West save $1.2 million in data center operating costs next year and shift personnel to key areas

MURRAE HAYNES

BY LARRY MARSHALL

US West, a diversified $9 billion communications firm based in Englewood, Colo., took the final step in automating its Albuquerque, N.M., data center more than two months ago. The Sept. 1 switch to a centralized operation control center capped two years of phased-in efforts to reduce data center staffing and improve staff productivity.

The project represents the first major step in a corporationwide automation of US West data centers. Larry Marshall, project manager of automated operations and the moving force behind the Albuquerque effort, takes you through the steps.

The whole idea began around mid-1987 in an off-site group meeting, actually an after-hours bull session. A bunch of us, including the operations director, were sitting around talking about the difficulties of centralization and the number of people required to monitor the system. We asked, "Isn't there some way to reduce the number of people by eliminating messages to the console?" A few months later, I latched onto a product brochure for an automated data center tool. "This is what we were talking about," I said. We were off and running.

US West was formed in 1984 from three Bell Telephone companies — Mountain Bell, Northwestern Bell and Pacific Northwest Bell. Last year, income from communications and data services totaled nearly $13 billion, up 12.6% from the previous year.

At the Albuquerque data center, our goal was to improve service, reliability and availability at the lowest possible cost. Many in the industry thought that system downtime stemming from human errors could be eliminated by automation.

Over the last two years, the concept of automated data center operations has become very popular, especially with large organizations that are running anywhere from a handful to several hundred data centers. "Lights-out" data centers run computers with little or no human intervention.

The idea of computers running computers is attractive because in such cases, computers are faster than humans, make far fewer errors and cost less to run.

Moreover, mainframe systems are becoming increasingly complex to operate, and there are shortages of experienced personnel. Coupled with a greater interest in managing geographically distributed data centers from a central site, the idea looks even more appealing. Reduced operating costs resulting from smaller information systems staffs also is a big plus.

The whole approach made sense to us: A typical mainframe in a data center can generate as many as several hundred thousand messages about hardware and software status in 24 hours. The large number of mainframe systems and the need for round-the-clock monitoring contribute to the labor-intensive and error-prone data center operation. Like many firms, our goal was a data center without any staff at all — a "dark" data center.

At our facility, we employed 47 computer operators, who monitor and control a mixture of 40 computer systems located in Albuquerque, Denver, Salt Lake City and Bellevue, Wash. We wanted to reduce data center operating costs so that efforts and investments could focus on developing new applications. We also wanted to improve the quality of service and centralize data center management.

Walk before you run

Our first step was to get a small pilot project going. We set up evaluation criteria for a six-month trial that would determine the most effective methods and technologies to implement. Our premise was that our data center could be "staffed" around the clock by four computer operators.

We surveyed every person in the data center who performed a job that could be classified as "computer operations." Evaluators also observed each of our computer environments — minicomputers from Tandem Computers, Inc., IBM, Unisys Corp. and Unix-based Pyramid Technology Corp. — using a time-and-motion study technique and examined computer console logs for each environment. We also continued looking at tools.

Tools for automated operations help a computer identify and respond to system console messages generated by a mainframe or attached minicomputer. The tool recognizes system errors or requests and processes them according to a predefined set of rules. These rules may specify a response to the computer system, announce a serious condition, display a graphical representation of the

Marshall is project manager of automated operations at US West in Albuquerque, N.M.

change in status or make telephone calls to support personnel.

Today, there are several automation products on the market, each focusing on different monitoring and control functions. Some products make voice announcements, offer a graphical representation of systems, interact with telephone systems, automatically restart devices and answer outstanding calls. Many tools, such as CA-Unipack from Computer Associates International, Inc., AF/Operator from Candle Corp. and OPS/MVS from MVS Software provide services such as message suppression, automatic job scheduling and report management. Most products are, in one way or another, expert systems.

Preventive medicine

By using such tools, we wanted to be able to see the symptoms before the problem occurred. Specifically, we were thinking of ways to automate restarting lines, eliminate lag time and improve hardware and software availability. For example, if computer-line quality were degrading, we wanted to catch it before it was no longer usable. Automated tools, we discovered, are made exactly for this purpose.

After evaluating several products, US West chose a product called The Intelligent Console (TIC) from Votek Systems, Inc. in Toronto. TIC is an IBM Personal Computer-compatible-based expert system software program running DOS.

Because it is an "outboard" system, TIC did not intrude on our mixed-vendor mainframe operation. Because each computer manufacturer uses a different operating system, a common presentation helps smooth over many differences. We developed a uniform graphics display for each computer system.

We decided that the first stage of the plan would be to monitor a network consisting of five Tandem systems in Albuquerque, Salt Lake City, Denver and Bellevue. Albuquerque was the first center to participate in the evaluation. The initial cost for this phase was $30,000 for the software plus the price of a Compaq Computer Corp. Deskpro 286 PC.

At the end of November 1987, we began implementation. Two of our staff members were trained by the vendor on-site to set up the initial database on the PC.

Setting up the system was fairly simple. An analysis of the Tandem message stream determined which messages to throw away and which were critical. We looked at what action was required, defining the action as well as the graphical display. The idea was to set up expert system rules.

Basically, the work involved systems design using a series of screens to manipulate the package. Users had two to four years of experience and some programming background. A technical analyst did most of the design.

The team set up TIC on the Deskpro 286, which was equipped with an audioamplifier, speakers and a microphone so that crucial system messages — such as "CPU SIX HAS FAILED" or "NETWORK COMMUNICATIONS LINE NO. 1 HAS BEEN INTERRUPTED" — could be digitally recorded on an internal disk and played back for a system operator during an actual problem. Besides vocal warnings, the new system would perform a variety of typical data center functions, including the following:

- **Monitoring major hardware resources** and notifying operational staff when critical error messages are received. Messages are sent by vocal warning, phone call or flashing red graphics.
- **Notifying staff** when various events indicate a need for preventive maintenance. For example, if the temperature or humidity anywhere on our seven floors of computer space exceeds the maximum level recommended by the vendor and notifying operators that the system had failed.
- **Providing scheduling reminders** for operational staff about predetermined tasks at specific times.
- **Automatically signing on** to the host computer and transmitting commands upon receipt of specific messages or when certain composite events are triggered.

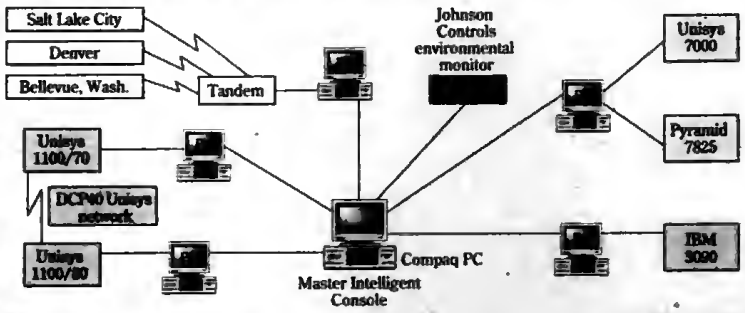
In December 1988, we introduced TIC to our IBM 3090 environment. At this point, every environment in the data center was automated.

Besides pointing out significant cost savings and benefits of automated operations, our initial study also examined the issues associated with the future of automated operations at US West. The plan was to merge all environments into one central "Operations Control Center."

As part of our continued lobbying, we flew the Unisys department manager to San Diego for a meeting of the Association for Computer Operations Management that focused on automation. He saw that this was a hot topic and jumped on the bandwagon pretty quickly. Based on the successful trial, a decision was made to proceed with the implementation of the control center. The OCC would be a focal point for monitoring every computer system in the Albuquerque data center plus the remote Tandems. Establishing an OCC in New Mexico would also be the first major step in a corporatewide strategy for automating data center operations. Our goal was to have a functioning OCC by December 1989.

Lights-out at US West's Albuquerque data center

A PC-based Master Intelligent Console oversees operations of Unisys, Pyramid, IBM and Tandem systems in one building, while directing remote Tandems in other Western cities



SOURCE: US WEST — CW CHART: FRANK C. O'CONNELL

US West's Marshall checks a control console at the Albuquerque data center

The system will log all manual operator actions for audit-trail purposes.

By March 1988, the automated system had been up and running for several months. Each of the Tandem data centers in the Western cities was unstaffed and monitored from the Albuquerque data center. Data center personnel were redeployed to more strategically valuable tasks, such as problem troubleshooting and assisting in applications development. The only manual intervention required was minimal tape mounting and monthly bootstrap loads. The next step was to propose the project to our Unisys systems operations staff. From March to June, we went through a long process of selling and educating the Unisys technical support staff. Fortunately, we had pretty strong support from data center management.

At first, the Unisys staff was concerned about the risks. Essentially, they would be an alpha test site for a Unisys-based system. I assured them that they could implement the system without damage. During this time, we installed a new Votek product called Ticplex, which allows up to eight computers to connect to front-end processors, performs high-level message filtering and prioritizing and connects to TIC.

Unisys-to-Unix link

Our efforts paid off. In June 1988, a TIC test system was introduced into the Unisys environment. We soon realized that an individual TIC system on an individual Unisys system didn't buy us much; we would still have a console and would simply be adding a device on the back. Eventually, we settled on a plan in which three Ticplex systems were used to monitor eight Unisys 1100 mainframes, seven Unix-based minicomputers and a mix of Unisys 7000s and Pyramid 9825s. After 30 days, the Unisys staff realized that the test was successful — it was a pretty informal process.

At the end of a six-month test, the project was a huge success. We had saved nearly $300,000 in data center operating costs and had redeployed personnel to more needed functions. More important, service and control were improved.

As part of the trial project, I wrote a cost-justification paper detailing what we could do with automated data center operations. Because he was part of the original bull session, my boss had already signed on to the idea. The concept was then presented to the head of all data centers, then to top management. At this point, I did not even talk about saving people. Our main reason was to try to improve service.

disk-drive heads are going to crash, the system will notify building maintenance. It also will call an engineer to do hardware maintenance if necessary or if a specific device fails.

- **Monitoring wide-area communications networks** and initiating predetermined actions. In case of a line failure, for example, the system would automatically restart the equipment instead of simply

Business as usual

The work of assembling the OCC began in February 1989. During the project, we deployed a total of seven US West "expert" computer operators to assist in the setup. On Sept. 1, 1989 — three months ahead of schedule — the OCC at US West's Albuquerque data center became operational. The switch-over was hardly a champagne event; business continued quietly as usual. No outages related to the OCC startup occurred.

To oversee the OCC, a master intelligent console — a Compaq Deskpro 386 with a 25-in. NEC color monitor — was set up as an overview system. It joined a mix of four other Compaqs that served as local intelligent consoles for the Unisys, IBM, Unix and Tandem systems.

During the process, the US West vice-president of information technology visited our site. He invited me to attend a staff meeting with the president of his division. The idea of automated data centers was well received.

Automated data center operations at US West has nearly paid for itself in the first year of operation; the project has been self-funding.

Expenses for the project — including TIC software, 16 PCs, all furniture and cabling — totaled around $750,000. So far, we have reduced data center

operating costs by $700,000. Other payoffs include the following:

• Staff redeployed to more strategic areas. Labor-intensive functions were eliminated, and workers shifted to more crucial areas such as application and network management and software development. Seven former technical support staffers and computer operators were promoted to "knowledge engineers" in charge of maintaining expert systems databases. Others were reassigned to areas such as network operations and systems software support.

As automation progresses, some computer operators evolve into "operations analysts," who can help solve serious problems that automation cannot handle. Their focus becomes finding the root of a problem, rather than merely taking immediate action.

As automation progresses, some computer operators evolve into operations analysts who solve serious problems that automation cannot handle.

• System is more centralized and easier to use. The message volume has been reduced and the operator console standardized.

While US West has realized major benefits from its reduced-staff data center, there are still advances to be made. Automated technology is still in its infancy. The following are some of automation's biggest challenges:

• **Eliminate labor-intensive functions.** For example, a large volume of print processing still takes place in the data center. Until print can be electronically distributed to users or replaced by on-line inquiry, electronic funds transfer, electronic billing, optical disc or another approach, print handling will require personnel.

Handling magnetic tape is another labor-intensive process. Though some products will handle these functions, people will be required to manage tape libraries until alternatives such as robotic-controlled media for high-volume data transport and backup are more fully developed.

We have begun exploring solutions at our Denver data center, including using tape stackers that can handle 10 cartridges, as well as robots using silo technology. We will look at using this technology in the IBM and Unisys environments in Albuquerque next year.

Even with full automation and lights-out data centers, workers are needed to manage and operate the automation tool, control the hardware and facilities, manage computer system software and perform complex problem analysis. Automation could remove these people from the "physical plant" but still require some staffing somewhere.

• **Develop more sophisticated control software.** Remote diagnosis and resolution of hardware device errors, which some vendors are beginning to address, is a problem. Also missing is software that can power hardware devices on and off, which is now done manually.

• **Include noncomputing devices.** To fully automate a data center, the automation tool must be capable of viewing the data center as a single entity, including environmental monitors. At US West, for example, TIC also monitors a Johnson Controls 85 environmental control system.

• **Staff and management resistance.** On the human side, dealing with displaced workers can be tricky. Systems people often resist change and reassignment. Ditto with managers.

At US West, the current strategy is the first step toward global, strategic automation of the complete IS organization. We project savings of $1.2 million from redeployed data center personnel in 1990.

We are also actively pursuing "enterprise automation," which will integrate and actively manage all control information, further improving service and productivity. The ultimate goal is to provide cost savings from labor reduction and fewer software licenses as well as improved service and better-managed systems. •

Do You Play Beat-The-Clock To Get Your Payroll Changes In On Time?

ADP's PC/Payroll™ puts time on your side by giving your authorized personnel direct access to your payroll data right through your PC—instantly!

You'll never have to wait to input changes again!

At the touch of a key, you can input, change, retrieve, validate and consolidate. Unlike many other payroll systems that make you wait a full payroll period to make even one change, PC/Payroll is a fully integrated system which lets you make as many changes as you want right on the spot.

It's easy, and fast. What's more, you'll not only save time, you'll also increase accuracy and productivity in your payroll processing.

For instance, PC/Payroll's unique Report Writer feature allows you to directly produce inquiry reports from information stored in the database—in minutes! And the best part is, once you have the reports, they can be output to the screen, printer or disk file, and the formats can be saved and modified for future use.

And since change and growth are part of every company, we designed PC/Payroll with built-in flexibility to grow and change with your needs.

Let ADP make you a winner at beating the clock by giving direct access to your payroll instantly. For more information, call today, **1 800 225-5237, ext. 222.**

ADP

©1989 Automatic Data Processing
One ADP Boulevard Roseland, NJ 07068

The way America gets paid.

You improve them.

Our Hayes PC communications products are regarded as the best in the world. But we're not about to rest on our laurels.

That's why we're adding more advanced features to many of our existing products. And more products to our line.

A line that already includes the right modem for virtually every communications need, no matter how simple or complex.

And new PC fax cards that let the PC world communicate with the fax world.

As well as software that contains features to make advanced communications easier.

What's more, we've lowered the prices of many of our higher

When you've set the standa for one decade, what

speed and advanced feature products, to make them more compatible with most budgets.

Of course, we're making sure that our products will be compatible with the future, too. Which is why you can always depend on your current Hayes modem to work with every new one we develop.

It's also why we're at the forefront of such important technologies as ISDN.

And why the only choice in computer communications equipment today will still be the only choice tomorrow.

For more information about Hayes products and the location of your nearest dealer, call 1-800-635-1225.

Hayes.

Our technology has the computer world talking. More than ever.

rds for PC communications
do you do for the next?

© 1989 Hayes Microcomputer Products, Inc. P.O. Box 105203, Atlanta, GA 30348

Why is COMPUTERWORLD the best read publication* among MIS executives in America?

Because it's the only weekly computer newspaper to offer complete coverage of every aspect of the information system. Can you afford to be last on the routing list for the news you need? Well now's the time to order your own subscription to COMPUTERWORLD. That way you'll stay abreast of all the latest news, products, people, developments, trends and issues — things professionals like you need to know to get ahead. And stay there.

Don't delay, order now. You'll get 51 information packed issues. Plus special bonus sections of COMPUTERWORLD Focus on Integration. You'll also get our special Spotlight section . . . featuring detailed head-to-head comparisons of the industry's latest products.

Use the postage paid subscription card bound into this issue and get your own subscription to COMPUTERWORLD.

*The Wall Street Journal (1987) — "Survey of the Information Processing Marketplace."
*The Adams Co. (1988) — "Information Systems Management Study."

INDUSTRY INSIGHT

James Daly

Fear and loathing

Along with turkeys to the slaughter, each November brings the autumnal certainty that the computer whirled will once again begin slouching towards Las Vegas. For 10 years running, we've packed our travel kits, promised to call home and headed out for The Week of Rising Cholesterol Levels known as Comdex.

But perhaps it's time to reconsider exactly why we engage in this annual meeting of the tribes. Impossibly overcrowded and hideously spread out, Comdex has become — like religion and the lyrics to "Louie, Louie" — endlessly debatable. On the personal enjoyment scale, most people rank the show just above a blow to the head. And the fact that it's held in steamy Las Vegas — where birds burst into flames in midair and nuns curse openly on the street — only contributes to the confusion.

A very nonscientific poll I took last week found that at least four of the expected 117,000 showgoers trek to the Nevada desert for the same nonscientific reason some little boys will blow up a frog with a firecracker — because it's there.

I find that difficult to accept but not impossible to believe. I have a black Labrador named Willie who chases neighborhood cats not because of any burning commitment to rid the free world of felines, but because he thinks he is supposed to. But he also believes that porcupine squeak toys are life's purest pleasure.

Don't get me wrong: Comdex does bring its special joys. It not only provides a quick pulse check on the industry, but it offers a legitimate excuse to have the company spring for a couple of tickets to Ann-Margret's "Kitten" routine.

But the original rationale for Comdex is long gone, swallowed up in rolls of its own fat. The important announcements now come in the weeks leading up to the show — witness the recent Hewlett-Packard and Compaq PC rollouts. One PR person even confessed that he'd never have

Continued on page 106

To CEO, polo is more than a shirt

BY NELL MARGOLIS
CW STAFF

HAMILTON, Mass. — "I'm a loooo-ser," the Beatles croon on the radio inside of the horse trailer — but Bob Daniels, who is leaning against the trailer catching his breath and toweling off, is anything but.

On this 90-plus degree late September Sunday afternoon, Daniels, 49, has just led his polo team, Pony Express, to an overtime upset victory in what will be the next-to-last match of the 1989 season at historic Myopia Polo.

"He went hard out there," Daniels says admiringly of one of his teammates, toweling off a few feet away. "He really wanted to win."

Both are sensations Daniels knows intimately — and not just on the polo field. Twenty-one years ago, armed with a new degree from MIT and the desire to do something pragmatic as well as lucrative with it, he founded Project Software Development, Inc. (PSDI), which is now an approximately $33 million project development software maker based in Cambridge, Mass., that he still heads as chief executive officer.

PSDI's Daniels *in a polo match at Myopia*

In 1980, at the relatively late age of 40, he took up the sport that now takes up most of his spare time. In addition to the summer season at Myopia, Daniels and his string of eight polo ponies compete in West Palm Beach, Fla., between January and March.

Play on the fast field, Daniels says, helps keep work in the fast lane in proportion. On the other hand, he adds, "A lot of the qualities you need for polo are the same ones you need in order to run a company. You have to be calm, collected, delib-

To page 109

Coming full circle to systems integration

BY RICHARD PASTORE
CW STAFF

ST. LOUIS — It seemed as if McDonnell Douglas Corp. had effectively clipped the wings of its computer operations this past summer when it announced complete and partial divestments of its Tymnet and computer systems divisions, respectively.

But one feather remained intact and unruffled — the company's a nearly 30-year-old systems integration operation. And according to President F. Mark Kuhlmann, his group can actually do a better job with the other divisions out of the way.

Because McDonnell Douglas had acquired the products of Tymshare, Inc. and Microdata Corp., "We strove very much to provide solutions on our own hardware with our own communications links," Kuhlmann told *Computerworld* in a recent interview.

But the company is finding that, more often than not, systems integration customers already have third-party platforms that they prefer to stick with. Consequently, the systems integrator has a tough time pushing the proprietary line.

"It gives you a greater degree of independence not to have all those [proprietary] pieces of the solution," Kuhlmann said.

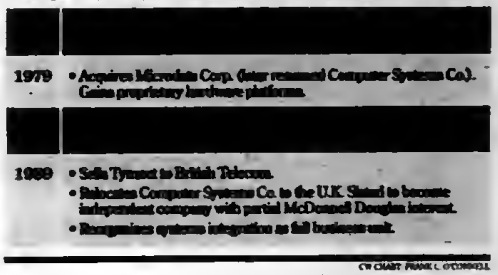
As far as the systems integration operation was concerned, those pieces had become onerous and expendable. "They were not a critical element of my systems integration effort; from a strategic point of view, we did not see that we had to maintain them," Kuhlmann said.

The reorganized McDonnell Douglas Systems Integration Co. has turned back to the strategy it embraced from its inception until the first computer sector acquisitions in 1979 — providing value through a variety of means, proprietary or

Continued on page 112

Back to the future at McDonnell Douglas

It all began 30 years ago with systems integration. Now that's all that's left.



CW CHART: FRANK J. O'CONNELL

CIS trustee puts bids on ice, ousts management team

BY NELL MARGOLIS
CW STAFF

SYRACUSE, N.Y. — Continental Information Systems Corp. (CIS) founder, Chairman, President and Chief Executive Officer Harry Goetzmann Jr. and all but one member of the CIS board of directors resigned from their respective posts early this month. The move leaves federal court-appointed Trustee in Bankruptcy James P. Hassett in charge of the financially devastated leasing giant.

Hassett, who was appointed late last month at the request of CIS creditors and shareholders who pleaded a resounding lack of confidence in the management team, hastened last week to assure both of these groups as well as end users of the firm's products that his arrival does not spell the end of CIS.

"Trustees come in all flavors," Hassett said in an interview with *Computerworld*. "I'm a full-fledged, court-appointed reorganization trustee — not a liquidation trustee."

While he said he foresees as much as a year's reorganization work before any definitive conclusion can be reached, he was guardedly optimistic about CIS' long-term survival.

"This is a real company, with real people — some very capable people — as opposed to, say, OPM, which was a big scam," he said. OPM Leasing Services Corp. is one of several computer leasing companies whose reorganization he has overseen as a court-appointed trustee.

Geneen bid now history

The advent of Hassett and the reorganization he foresees as the likely best alternative for creditors and users put pay to the plans of industrial force Harold Geneen, whose management-sanctioned bid to buy CIS out of bankruptcy is now history.

According to Hassett, the Goetzmann-headed management team whose strategic decisions were widely blamed for driving CIS into Chapter 11 early this year also jumped the gun in putting the company up for sale.

For starters, he said, "It's unknown what tax liability the company may have; the IRS has now come along and is starting to levy taxes. No buyer would buy a company that has an undetermined tax liability hanging over it."

A further barrier to prudent bidders, Hassett said, is the fact that CIS "is not in a position to adequately value its assets. You can't sell what you can't describe — not without taking a big bath."

Earlier this fall, the consortium put together by Geneen to acquire CIS offered $420 million for the company. [CW, Sept. 18]. A rival bid submitted by Boca Raton, Fla.-based computer leasing and investment company Finalco, Inc., according to Finalco Chairman Harold Von Arnem, was preferred by the creditors' committee but given short shrift by management.

Daly

CONTINUED FROM PAGE 105

his clients introduce anything there. "They'd be crazy to," he said. "It would get lost in all the noise."

So what can be expected this week? The big news at last year's show highlighted the conflict between the Gang of Nine and IBM.

This year, on the other hand, we'll at least be able to see some of those new Extended Industry Standard Architecture machines.

In addition, there is sure to be some gum-flapping over Intel's flagship semiconductor, the 80486. Until a flaw was recently discovered in its design, vendors eagerly threw their support behind the chip.

Now they approach it with the trepidation of kids standing at the edge of a pool in April; they'd love to dive in but the water is still a bit too chilly for their liking.

The fact is, the most interesting tidbit I've heard so far is that the show organizers at the Interface Group are building a new convention facility to accommodate Comdex's 8% to 10% annual growth rate. They'll also cut the show's 10 locales down to four.

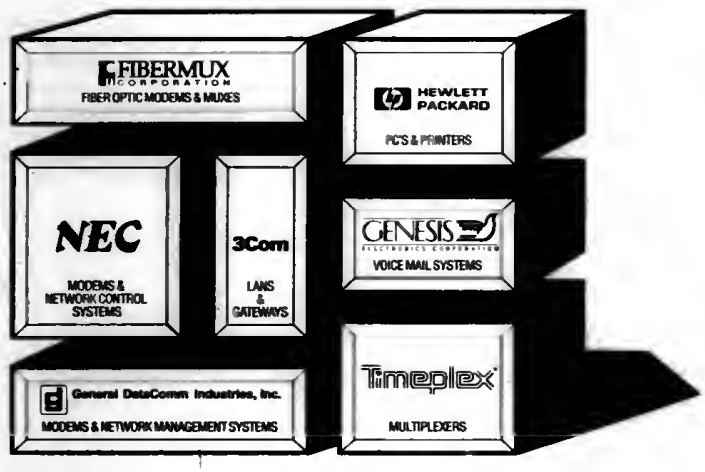
Maybe it's just time to accept Comdex as a necessary evil. For journalists, the weeks leading up to it are reminiscent of those grainy World War II films of the invasion of Normandy.

My colleagues and I hunker down in our landing ship, PR flak shells splashing in the water around us. When finally we reach the shore, the gangplank falls down, and we head out onto Las Vegas Boulevard in sensible shoes.

So as I pack my shaving kit and zip up the suitcase, I'm starting to wonder whether we've all been the victims of some elaborate scam. I'm starting to wonder if the show organizers aren't sitting in some back room, drinking frozen daiquiris and laughing themselves sick.

But that's a discussion for another day. Right now I've got to catch a plane to Vegas.

Daly is a *Computerworld* West Coast correspondent.



In the data business, sometimes it's better to mix and match.

At GTE, our data sales specialists and engineering specialists have researched, planned, designed, and implemented literally hundreds of data systems, large and small. Many times, we've found it more efficient to design a network by selecting state-of-the-art components from a variety of manufacturers. We MIX products and MATCH protocols, to meet your needs.

And when you finally make your purchases, our loyalties are with you – not to any particular brand name.

Besides knowledge and experience that span the entire telecommunications industry, GTE offers one distinct advantage. We'll stand behind any data system we sell with our highly trained service staff.

When you're ready to select a data communications system, or upgrade the one you have, do two things.

Forget everything you know about shopping. And call your GTE Account Manager. GTE, the data communications systems integrator.

GTE

THE POWER IS ON

NEC is a registered trademark of NEC Corporation.

IN BRIEF

Still the downside

Prime Computer, Inc. early this month reported a $104.8 million net loss for its third quarter — a figure that would have been recorded in black ink rather than red without a $130 million pretax restructuring charge. Meanwhile, the company is already beginning to explore the newly acquired liberty that comes with private ownership. Chief Executive Officer James McDonald said, "We've told manufacturing, 'Don't ship until you're sure of quality.' " A luxury best enjoyed beyond the eyes of Wall Street? "Absolutely," McDonald said.

Deeper and deeper

Computer Sciences Corp. is negotiating to buy its way three steps — and approximately $42 million — further into the commercial information technology consulting and systems integration markets, the company announced last week. On the other side of the bargaining table are Saatchi & Saatchi PLC subsidiary Cleveland Consulting Associates, Inc.; Minneapolis-based computer services firm LPS, Inc.; and consulting firm Inforem Ltd., based in the UK.

Asher to asher

A consent solicitation aimed by discontented Datapoint Corp. shareholder Martin Ackerman at unseating the company's board of directors ended last week. Datapoint Chairman Asher B. Edelman, an individual as well as corporate target of Ackerman's failed campaign, publicly declared the board "committed to maximizing the value of Datapoint shares for all shareholders."

DRAM deal

IBM and Boise, Idaho-based chip maker Micron Technology, Inc. inked an agreement last week under which Micron will license IBM's 4M-bit dynamic random-access memory technology. The deal, however, does not prohibit licensing of the advanced chip technology — an acclaimed IBM first — to other companies, including recently created consortium U8 Memories, which is currently involved in talks with IBM on just that subject.

Breather

Miniscribe Corp. has secured an extended temporary exception from the National Association of Securities Dealers, Inc.'s (NASDAQ) filing requirements. The struggling disk-drive maker now has until Dec. 8 to file its 10-K for 1988 and quarterly financial reports for the first three quarters of fiscal 1989 or be removed from NASDAQ's listings.

Free Brochure on Integrated Solutions

Name _____

Title _____ Phone _____

Company _____

Street Address _____

City _____ State _____ ZIP _____

Application/business of company:

_____

NO POSTAGE
NECESSARY
IF MAILED
IN THE
UNITED STATES

BUSINESS REPLY MAIL
FIRST CLASS PERMIT NO. 9079 HUNTSVILLE, ALABAMA

POSTAGE WILL BE PAID BY THE ADDRESSEE

Intergraph Corporation
Direct Marketing
Mailstop HQ1006
One Madison Industrial Park
Huntsville, Alabama 35807-9985

Imagine UNIX workstations as easy to use as a Macintosh.

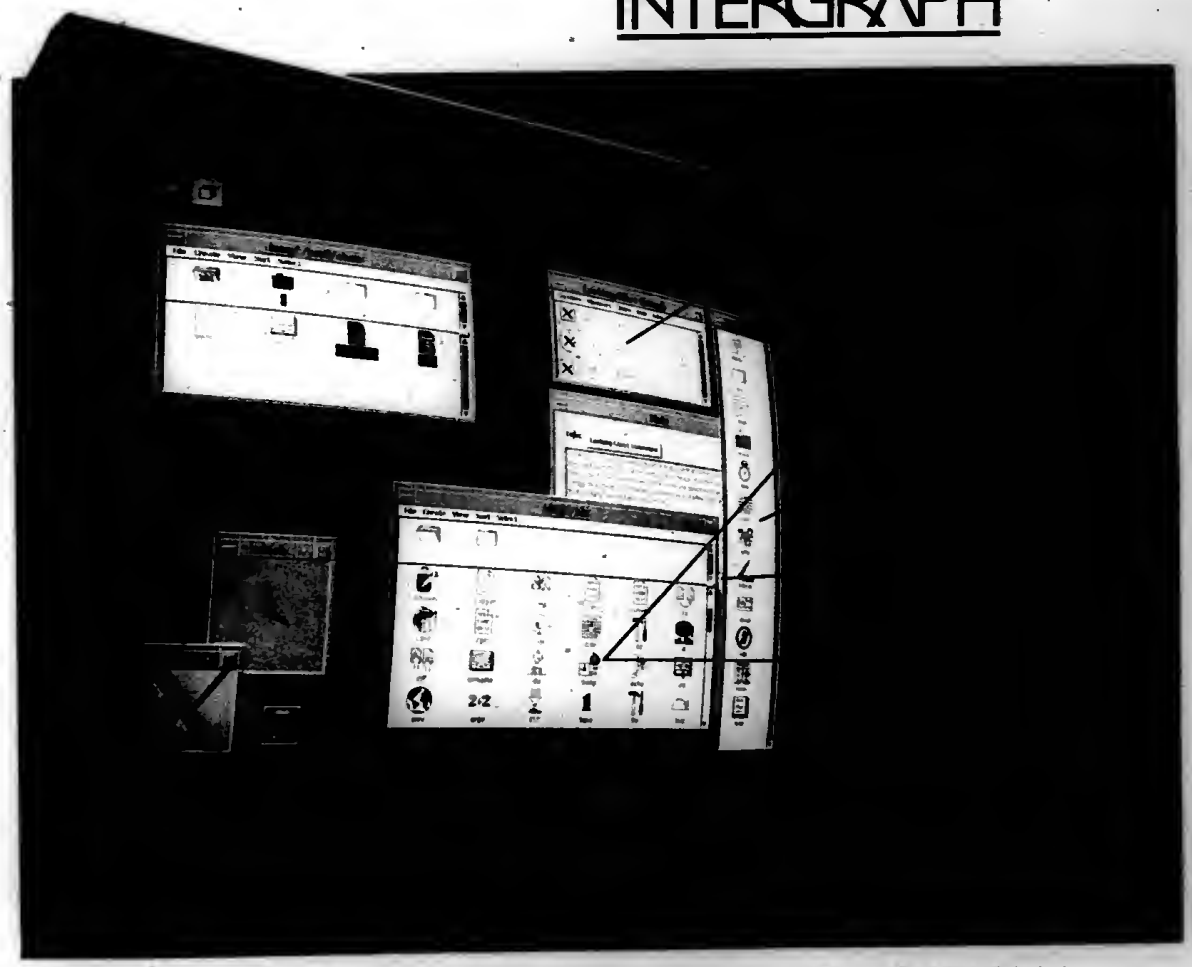
Now they are reality. Intergraph announces the first easy-to-use workstations with the power of UNIX® and the simplicity of Macintosh®. That's because our workstations offer Looking Glass®, the first user interface for UNIX operated by icons and a mouse. Looking Glass, from Visix Software, Inc., is fully compliant with the new OSF Motif look-and-feel industry standard.

You don't have to learn complicated syntax. Everything's done with icons, pull-down menus, and interactive dialogue windows. And, with the context-sensitive help system and plain-language error messages, you don't have to keep referring to user manuals.

Looking Glass is user-configurable. You can modify more than 400 icons and create new ones as your needs change. Looking Glass is as powerful as it is easy to use. In fact, it's faster than command line shells for standard UNIX operations.

So, for all your system needs, choose the power of UNIX and the ease of Looking Glass, based on industry standards. Available from Intergraph, the acknowledged leader in applications solutions. Call 1-800-826-3515 in the United States, 416-625-2081 in Canada, 31-2503-66333 in Europe, or 852-5-866 1966 in Asia.

INTERGRAPH



Intergraph is a registered trademark of Intergraph Corporation. Macintosh is a registered trademark of Apple Computer Inc. Looking Glass is a registered trademark of Visix Software, Inc. Other brands and product names are trademarks of their respective owners. The Macintosh user interface is made by Apple Computer, Inc. Apple Computer, Inc., does not make or license the Looking Glass user interface.

NCR's Exley on open systems and 1992

Charles E. Exley, president of NCR Corp., recently spoke with Computerwelt Oesterreich's *Gerhard Rainer in Vienna on DOS, OS/2 and Unix, with a special emphasis on Europe.*

Do you think there is some rivalry between OS/2 and DOS?
I think there is some rivalry, but there are very big differences, so the competition is not entirely direct. First, Unix is a multiuser system, very different from DOS and OS/2.

Second, Unix is a portable system. Both OS/2 and DOS, as they exist today, are specific to a particular instruction set. In particular, DOS is specific to what one might call the "flight simulator standard" of personal computers, which is a very confining standard. Unix offers opportunities for system designers to be more creative in coming up with new and better hardware platforms. The best offering will be a hybrid offering, utilizing client server architecture, utilizing both Unix at the server and OS/2 or DOS at the workstations.

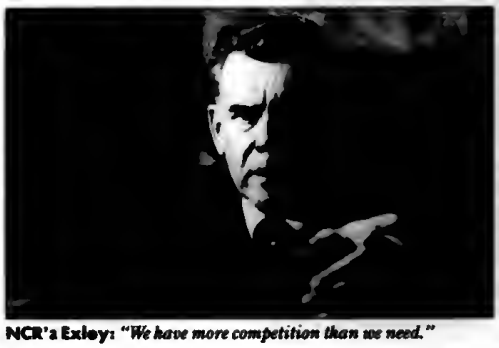
Could you specify your expectations for the growth rate or the installed base of Unix systems in Europe?
I would say, for some time to come, high double-digit growth rate for Unix installations. We are experiencing that kind of growth rates ourselves, and I assume others are as well.

What do you expect from IBM's increased activities in the Unix market?
I can't comment on competitors or what they are doing. What is significant is that major companies today have endorsed the concept of open systems. That is a tremendously important development. And it is very clear that open systems will be the central direction of the computer industry in the future.

Will IBM's movement toward Unix promote the operating system? Will it be an advantage to the whole Unix community?
[Without commenting on any specific company,] if you look at the five largest companies in America, they have all endorsed the open systems concept recently.

Do you see some problems for the Unix market because of the rivalry between the Open Software Foundation and Unix International?
I do. I think it is unfortunate from the users' and from the customers' standpoints. I would like to see these two groups brought together to form a common agreement on standards. I think it would be in the interest of the customer and the industry, too. We have made several attempts to bring that about, but up to now we have not been successful. The OSF was triggered by some events that raised a very understandable concern in the minds of a number of the people who then formed OSF. But I believe that all those concerns today can be answered by a unified organization. So I am still hopeful.

What are NCR's expectations in the common European market, and what developments do you see in the future?
I think [the coming common European market] will stimulate economic growth and be good for NCR, since we are basically a capital-goods company. We will be able to deliver those items for which quick delivery is important — for example, personal computers. The movement of goods and the handling of central stocks of goods will be much facilitated. With respect to our employees and customers, we already operate on a one-world basis. We don't consciously try to appoint general managers who are nationals of the country in which they are working. Most of the time that's the way it works out, but we don't make a rule of it.



NCR's Exley: *"We have more competition than we need."*

We regard NCR people as being interchangeable nationally and try to find the best people for the job, wherever they are.

Nevertheless, in Europe there are several diffent societies, both socially and linguistically.
I agree with your point. Even though after 1992, Europe will be more homogeneous than it was before, it certainly will still not be as homogeneous as the U.S. It is also true that there are significant differences in the characteristics of the markets from country to country, and I think many of those will persist. So, if you look around the world, you notice that we have many products that are important in the U.S. that are not important in Europe and don't fit the market in Japan. Automated teller machines, for which we are the world's largest supplier by far, are not sellable in Japan. We have to continue to be conscious of the fact that there are differences nationally in the market.

What part does your European business play in relation to your overall business?
We, of course, sell unfinished products, such as semiconductor devices and other kinds of components; but when you talk about finished-product sales, today Europe is our largest group — bigger than the U.S. group in finished-product sales. Total non-U.S. business accounted for 58% of our overall revenue last year. And I expect over the next decade that the percentage of our business outside the U.S. will continue to increase to about 65%.

Will there be no growth in the U.S.?
I think there will be a faster growth outside [of the U.S.]. There are more than five billion people in the world, but only 240 million in the U.S., so [non-U.S.] is bound to be a fast-growing market.

Isn't it difficult for a hardware company with all the competition around, particularly competition from the Far East that can produce much cheaper components?
We have more competition than we need. Our basic strategy is that we want to do both. So, our development and production of units are divided into two groups. One group is called the general-purpose products group, and they provide the hardware. The other group — the integrated systems group — provides integrated systems both for vertical and horizontal markets. And the general-purpose products group sells its products to the systems integration division.

NICKELS & DIMES

Measurex Corp. posted a 6% increase in net income for the third quarter of 1989 with revenue of $72 million. Revenue for the period, which ended Sept. 3, increased 5% from $68.3 million in 1988's third quarter. Net income for the quarter was $10.1 million, up from last year's $9.5 million.

Newbridge Networks, Inc. announced the results from operations for the first quarter of fiscal-year 1990, ending Aug. 5, 1989. Sales for the quarter were recorded at $27.3 million (Canadian), representing an increase of 170% over revenue of $10.2 million recorded for the first quarter of the fiscal year 1989. Net income of $4.2 million for the quarter represented an increase of 695% over fiscal 1989 first-quarter net income.

Digital Communications Associates, Inc. reported earnings of $7.1 million for its first fiscal quarter ended Sept. 30, compared with $7.1 million reported for the corresponding period a year ago. Revenue totaled $53.1 million compared with $51.7 million for the corresponding quarter last year.

Olsen tells stockholders DEC will ride out recession rigors

BY RICHARD PASTORE
CW STAFF

BOSTON — Like a football coach trying to drum up team spirit after a couple of rough seasons, Digital Equipment Corp. President Ken Olsen last week told DEC stockholders: "This is by far the best recession we've ever been in."

Olsen backed up his rose-tinted observation by explaining that the computer industry recession is not worldwide, as the computer markets in Europe and Japan are booming. He also said that DEC's line of new products positions the company admirably.

Addressing the approximately 160 attendees at DEC's annual meeting of stockholders, Olsen reaffirmed his company's strategy of not giving ground in bad times.

"Every recession we've been in, people have asked us to cut back, to lay off people," he said. But we've always had confidence in our products and people. We're setting out to grow, not retreat."

Early this month, DEC formally announced that a six-month wage freeze will end on Jan. 1. However, according to the company, tight hiring restrictions are still in effect.

Olsen conceded that the company's performance pales in contrast with the glory years that marked the mid-1980s. "Compared to three years ago, we're doing poorly," he said.

This state of affairs has caused DEC to hold the line on research and development investment. "We have to stop where we are. There's a lot more we'd like to invest in, but we're not," he said.

When pitted against other players in the minicomputer field, however, DEC is doing well, Olsen said. "Most of our competitors are gone or almost gone," he said. "The contest is nearly over."

STEVE SIEGELMAN

DEC's Olsen *says firm is in "best recession" it's ever seen*

Flanked by products ranging from dumb terminals to the new VAX 9000 mainframe, Olsen could not resist mounting the soapbox.

"Eight years ago, the [*Boston*] *Globe* and *Business Week* wanted my head because they said I was too old to realize that PCs would wipe out minis and mainframes," he said. "They don't say that anymore."

Olsen also emphasized software strategy, specifically integrating the VMS and Unix operating systems and fostering software interchangeability. Olsen said Unix promises to be the operating system around which an industry standard can arise.

Daniels

FROM PAGE 105

erate — you have to be competitive and willing to fight hard." Whether you are focused on the final goal or the bottom line, he says. "It's still the same old story — if you're doing nothing, you're doing something wrong."

Polo, he says, is not a pleasure into which one can dip occasionally. "People who get into it have to [be] ready to dedicate an incredible amount of time," he says. What's more, he adds, anyone bent on becoming an overnight sensation would be well advised to avoid the polo circuit.

"This is a very mental game," Daniels noted. "It can take seven or eight years as a player just to really tell how it works."

It also helps to have a taste for nonstop laying polo is kind of like being a fighter pilot; a lot relies on split-second thinking." Another, perhaps ironic, similarity between Daniels' vocation and avocation: "Despite appearances, the faster you're going, the less dangerous it actually is." In polo, as in the computer industry, injuries are more likely to occur during slower phases. In his tenth season at Myopia, Daniels reports no broken bones.

PSDI's Daniels *receives an East Coast Open trophy in 1988*

At the moment, in fact, the injury risk may be greater for him when he takes off his polo uniform and gets into his business suit. Privately held PSDI, whose approximately 280 employees serve an estimated 15,000 project development users, has traditionally enjoyed annual growth in the ballpark of 20% or better. In this fiscal year, said Daniels, the company — still in transition from rental-based to sale-based revenue and slogging it out in the competitive software market — will not maintain its accustomed batting average. In fact, a slight downturn in revenue is likely.

Daniels reacts to the rougher workplace game much as he reacted on the field when the Pony Express had fallen behind with seconds left in the chukker. "It wouldn't be very interesting if it were always straight up," he says.

For Daniels, polo is not just a challenge and a pleasure, but a family occasion, figuratively and literally. Many entrepreneurs belong to the Myopia Hunt Club. "In fact," said Daniels, "I met Jim McGowan, who's now the chief operating officer at PSDI, at Myopia. He's a player." If entrepreneurs abound on the playing fields in Hamilton, however, so do Danielses. All three of Daniels' sons — Kenny and Greg, both college students, and Marc, a sophomore in high school — have ridden competitively.

HP sets plan to cut 330 from Apollo division

BY NELL MARGOLIS
CW STAFF

PALO ALTO, Calif. — Hewlett-Packard Co. early this month announced that it will eliminate some 330 jobs at its Apollo Systems division as part of an "additional consolidation" of the two companies.

The latest cut, which will fall most heavily on Apollo's product-repair operation in Chelmsford, Mass., and its manufacturing plant in Exeter, N.H., will affect administrative, marketing and research and development jobs, according to HP. It comes approximately six months after HP's acquisition of the workstation pioneer.

"It's hard to characterize whether this layoff is good or bad," said Peter Rogers, an analyst at Robertson, Stephens & Co. in San Francisco. "One has to wonder why this is coming so far into the process. My sense is that HP has not moved as expeditiously as they could have, or should have, in integrating the companies. I think there have been some unexpected clashes in cultures."

Begging to differ

"Actually," said an HP spokeswoman, "we don't think this is late in the game." HP, she noted, acted promptly last spring to eliminate obvious redundancies, "but when it comes to repair center functions, for instance, these are the kinds of things it takes some time to study."

HP did not deny that the parent company's culture and that of its Apollo division are not an automatic perfect fit but said that a period of adjustment was both foreseeable and, in fact, foreseen.

"A lot of Apollo people were no doubt attracted to Apollo specifically because it was an entrepreneurial company; HP is No. 39 on the Fortune 500 *without* Apollo," the spokeswoman said.

1979 1989

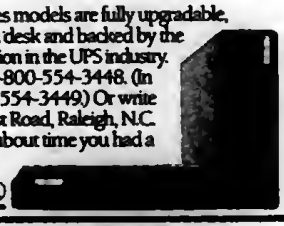
At the same time, power problems have only gotten bigger.

Today over half of all problems with small computers are power related.

With more than 25 years of experience in power protection around the world, Exide Electronics designed the Powerware Personal Series to provide online power conditioning as well as up to 15 minutes of emergency back-up power for a single PC or a network of small computers.

All Personal Series models are fully upgradable, small enough to fit on a desk and backed by the leading service organization in the UPS industry.

Call us today at 1-800-554-3448. (In North Carolina, 1-800-554-3449.) Or write us at 3201 Spring Forest Road, Raleigh, N.C. 27604. After all, isn't it about time you had a power system that's as advanced as your computer?



Powerware Personal Series From Exide Electronics

Trusthouse Forte Hotels sleep easier since AT&T Computers checked in.

San Diego, California
April 27, 1989

Trusthouse Forte needed to automate its reservations and property management system so it could manage its properties more efficiently and improve customer service. AT&T and AT&T Authorized Value-Added Reseller, Encore® Systems, Inc., created a solution for over 500 hotels by integrating the reservation system with a property management system. AT&T's Jerry Trapp and Encore's Mike Otten join Trusthouse Forte's Bill Hanley to retell the story.

Bill: Dated. That's how I would describe our old reservation and guest billing systems. They just couldn't reserve rooms or bill our guests fast enough. On top of that, some hotels were manually booking rooms while others were running a smorgasbord of property management software packages.

Jerry: Because nothing was plugged into your central reservations system. Your guests were not getting the service they deserved. And it was driving your hotel managers nuts as well.

Bill: And when your customers don't get service, that's when you lose their business. You can see why I needed a lodging expert like AT&T, who understood my business well enough to customize a bulletproof solution to it. Who could seriously integrate software and hardware without trashing the huge investment I'd already made in my current system.

Jerry: You needed to turn the dated system into something you could really use. Fortunately, AT&T has solved a number of problems like yours in the lodging industry. And we chose to team up with another lodging pro like Encore Systems, Inc. Together we could really zero in on your special software demands.

Mike: That's right. We knew right off that you needed a lot of flexibility built into the system. For example, it had to be able to be used at any size hotel—from 40 rooms to 400.

Bill: Which is critical. We want the smaller hotels to get as much out of it as the large hotels. And they are. Now our hotels have the ability to create guest profiles. Plus customer billings from restaurant to phone to movie charges are all automated. Now our managers can spend more time on their most important job—keeping our guests happy.

Jerry: Another nice advantage is that they can, in seconds, interactively reserve rooms all over the world. And then monitor and report results back to headquarters. So headquarters, in turn, can use that data intelligently for designing future marketing programs.

Mike: The quality of service you're giving your guests is soaring.

Bill: You said it, Mike. In fact, we've heard good things from the hotels that have the system rolling. Service standards are better and reservations are made in a flash. And satisfied guests are what we want most in this business.

The Trusthouse Forte Computer Solution

Your Computer Systems And Networking Solutions Company

Encore is a registered trademark of Encore Systems, Inc. UNIX is a registered trademark of AT&T in the U.S. and other countries. © 1989 AT&T

AT&T Computer Systems

Full circle

CONTINUED FROM PAGE 105

third party.

Kuhlmann said the company will put a much greater emphasis on third-party products. "We will move from almost 100% proprietary solutions to a blend of maybe 50% third-party solutions," he said.

To back up this change, McDonnell Douglas is aggressively cultivating third-party alliances. It already has pacts with Digital Equipment Corp., Oracle Corp. and Hewlett-Packard Co.

Analysts agreed with Kuhlmann's assertion that the proprietary lines were hampering rather than helping integration efforts. The idea of pressing an integrated group of proprietary systems on customers never really gelled, said Jerry Cantwell, an analyst at Wertheim Schroder in New York. "It was frankly not exactly what the world was looking for," he said.

Kuhlmann encourages companywide integration

In the wake of its restructuring as an independently functioning business component of the parent company, Systems Integration Co. has installed a new executive team.

Its nine members, announced last week, have been charged with improving the efficiency of day-to-day operations.

One step already under way is the consolidation of once-separate customer operating sectors such as computer-aided design and shop-floor manufacturing into one group that will focus on the broader customer market of manufacturing.

Analysts agreed that the divestment and organizational changes should lead to more focused support of the systems integration business.

In addition to a trend toward third-party platforms, Kuhlmann sees customers becoming more interested in companywide, as opposed to departmentwide, integration.

"Before, the thrust was to automate the functionality within a department with stand-alone systems," he said. "We're now looking at an enterprise approach."

Kuhlmann disagrees with some industry claims that outsourcing is no longer an important service that systems integrators should offer. McDonnell Douglas will target its outsourcing services to companies undergoing buyout or spin-off transitions. Such firms "do not want to devote resources to building a data center," he said.

"For them, I think outsourcing is precisely what they need to do."

Not All Software Giants Start Out In California Garages.

Take mbp, for example. We started out in Dortmund, West Germany, providing computer solutions for the $3.4 billion industrial giant, Hoesch. Not exactly a garage.

Independent Since 1957

We became an independent (but wholly-owned) subsidiary of Hoesch in 1957. Which means, among other things, that we were already in business when a byte to Bill Gates was still a form of teething.

Today, we're a $70 million company, bringing high tech expertise in COBOL, office automation, data processing, computer-aided design, communications, and process control to major corporations all over the world, from offices in fifteen countries.

Experts In COBOL

One example of our expertise is Visual™ COBOL, an ANSI-85 COBOL compiler with VS COBOL II™ extensions that generates true native code for micros in a variety of environments, including UNIX®, DOS, OS/2,® and others.

Visual COBOL is a full-featured compiler which includes such productivity tools as Visual Debug,™ Visual Assistant™ and Visual SMS,™ a WYSIWYG screen management system that automatically handles screen displays, color and attribute changes, cursor positioning, data I/O and windowing. Visual SMS alone spares programmers the need to write hundreds of lines of code. Access to all compiler functions—Edit, Compile, Link, etc.—is handled by a menu-based interface, so all primary functions are only a keystroke away.

For more information, a free demo disk, or a 30-day product evaluation, contact us at 800/231-6342, or 800/346-4848 in California. Call 415/769-5333 from outside the U.S. Or FAX 415/769/5735.

mbp 1131 Harbor Bay Parkway Alameda, CA 94501

A member of the Hoesch Group

Visual COBOL, Visual Debug, Visual Assistant and Visual SMS are trademarks of mbp Software and Systems Technology, Inc. VS COBOL II and OS/2 are registered trademarks of International Business Machines Corporation. UNIX is a registered trademark of AT&T.

NEC merger seeks to unify product lines

BY ELLIS BOOKER
CW STAFF

WOOD DALE, Ill. — Pulling down the barriers between its computer and computer peripherals groups, NEC Corp. began the month by merging NEC Home Electronics U.S.A., Inc. and NEC Information Systems, Inc., based in Boxboro, Mass.

The parent company said the new $1 billion entity, NEC Technologies, Inc., will also be based in Boxboro and will seek to unify NEC's product lines, which stretch from laptop computers and peripherals to videocassette recorders and video games.

Richard M. Underwood, former president and chief executive officer of the information systems group, has been named chairman of NEC Technologies; Yuji Ohashi, former president of the home electronics group, will be president of the new enterprise. NEC plans no hirings or layoffs resulting from the merger.

The former home electronics operation in Wood Dale, with its 1,100 employees, will handle laptop computers, monitors and compact disc/read-only memory technology. The Boxboro operation, which employs approximately 1,600, will handle personal computers, printers, disk drives and multiuser systems.

NEC said there would be no structural changes at the current Home Entertainment, Audio/Video and Professional Systems units, also based here, nor at the Automated Fingerprint Identification unit in Washington, D.C.

Mike Andersen, former executive vice-president at the information systems group, will be executive vice-president at NEC Technologies. Keith Schaefer, former senior vice-president at the home electronics group, will become senior vice-president of the merged company.

Bruce Stephen, who tracks the laptop market for International Data Corp. in Framingham, Mass., said the merger was necessary to prevent "collisions" between product lines at the two units.

"NEC Home Electronics was producing more and more powerful laptops, and IS was expanding its transportable line," he said. "It was only a matter of time before the two began to compete."

Are MBAs really that vital?

Solid work experience can garner as many points as an advanced degree

BY JANET MASON
SPECIAL TO CW

Although some bill it as the key to the executive suite, a master's degree in business administration holds no guarantee of career advancement for the information systems professional.

In some companies, particularly large corporations and consulting firms, an MBA can open the door to management or bring a larger starting salary. However, in most hirings and promotions, experience is weighed far more heavily than an MBA, according to a number of observers. The value of an MBA thus lies in parlaying the education into solid business experience.

Consultants and recruiters express a wide range of views on the value of an MBA. Walter Popper, a principal at Index Group, Inc., a Cambridge, Mass. consulting firm, contends that an MBA is the crucial first step toward management.

"In many companies, the MBA is the ticket to management. You won't get the position without it," Popper says.

Popper notes that techniques for automating software development, such as computer-aided software engineering, call for systems developers to possess a greater understanding of their company's business. Increasing use of such tools should lead IS organizations to place a growing value on employees with a business education, he says.

John F. Rockart, director of the Center for Information Systems Research at MIT's Sloan School of Management in Cambridge, Mass., contends that an MBA can help IS professionals move into line management, increasing their mobility and earning potential.

At large consulting firms, an MBA can clearly help technical professionals understand applications from the user's perspective, says Charles Emley, partner in charge of information technology consulting at Touche Ross & Co. in Los Angeles. Approximately half the people Touche Ross hires have just received an MBA, while the others are hired primarily for their work experience.

Other observers emphasize that work experience can outweigh formal education. "The MBA is no ticket to IS management," says Roger Sobkowiak, a partner at Software People Concepts, Inc., a New Haven, Conn., recruiting firm. If the choice is between an IS professional with an MBA and one with solid experience working with users, the one with the experience will be chosen for a position, he says.

At Boeing Computer Services, a division of The Boeing Co. in Bellevue, Wash., IS professionals are encouraged to obtain MBAs, like other degrees, through a tuition reimbursement plan. The broader outlook they acquire with an MBA can help them better understand decisions made in the company, says Elaine deLappe, the division's manager for human resources support services.

Workers who pursue an MBA can put their newly acquired knowledge to work and might take on more responsibilities and move into management more quickly, deLappe says.

"But once they get an MBA, there's no magic," she says. "They are not automatically put on a management track or given a pay raise." Boeing Computer Services does not overtly recognize an MBA the way it would promote an employee who earns an undergraduate engineering degree.

An MBA can be a tiebreaker in decisions on promotions or hirings, especially at large corporations where the credential may be more highly valued, says Cameron Carey, president of Computer Security Placement Service, Inc., a recruiting firm in Northboro, Mass. "It's usually better to have one than not have one," he says.

However, the most important factor in furthering a career is to possess a clear direction, according to Carey. "The person who doesn't have a clear vision, who's just going to get the MBA because it seems like a good idea, ought to forget it. To go in willy-nilly and just do it to get the sheepskin is going to be time wasted."

> "ONCE THEY GET AN MBA, there's no magic. They are not automatically put on a management track or given a pay raise."
>
> ELAINE DELAPPE
> BOEING

According to Carey, an MBA program can acquaint students with the major disciplines of business, providing the background with which to focus career goals more sharply. "But that could be done in a business library as well," he says. "I feel one needs more purpose than that to justify the expense of time and money."

For people who opt for an MBA, work experience still can be important as a prerequisite. "Without it, there's a tendency to treat everything in school as if it's equally important, and it's just not," Carey says.

Observers differ as well on whether an MBA can help boost earnings in the IS field. Sobkowiak says it will not enhance them dramatically.

Emley says consulting firms tend to place more value on MBAs than do corporate employers. Take, for example, a corporate IS employee with a technical undergraduate degree and three to five years of experience, earning about $60,000 a year. By completing a "first-class" MBA program, he might boost his pay $5,000 to $10,000 at the corporation. However, if he moved to a consulting firm after getting the MBA, he might increase it by $10,000 to $15,000, according to Emley.

An MBA can give IS people a greater starting salary, but as they gain experience the premium shrinks, says Thaine Lyman, another Touche Ross partner. "A person with 10 years of experience has no reason to obtain an MBA," he says.

Mann is a Philadelphia-based freelance journalist.

Data Processing Professionals
Career Opportunities

Orlando Regional Medical Center is a leading 1,100-bed, multi-facility, tertiary care organization with more than 200,000 annual outpatient visits. Our Information Services Department is currently expanding and is in need of experienced individuals with demonstrated expertise in healthcare computer software design, development, implementation, and support.

We are seeking Application Software Professionals for positions ranging from Programmers to Systems Analysts. Successful candidates will have experience with IBM 3090 MVS mainframe or DEC VAX/VMS systems, and will be competent in a combination of COBOL, CICS, IMS/DB, PCS/ADS, SAS, and EASYTRIEVE. Individuals will possess effective communication skills and a willingness to work across organizational boundaries.

In exchange for your talents, we provide an attractive salary/benefits package and the added bonus of Central Florida living where you will enjoy an array of recreational and entertainment opportunities and no state income tax or snow.

For immediate consideration, please forward a copy of your resume to **Orlando Regional Medical Center, Employment Department, 1414 Kuhl Ave., Orlando, FL 32806.** An Equal Opportunity Employer.

Orlando Regional Medical Center

Hardware/Software engineers —

Add SPARC to your career!

ICL is AT&T's and Sun Microsystems' development partner for UNIX V.4 on SPARC-based minicomputers and will be providing the reference port. Join ICL and contribute to this leading-edge development of industry standard systems!

ICL North America was formerly CCI Computers, a pioneer in UNIX-based minicomputers. International Computers Limited is the largest computer company in the U.K. with 1988 revenues of $2.3 billion.

ICL's Technology Development Center in Irvine, California is looking for:

- **SENIOR UNIX KERNEL PROGRAMMERS**
  5+ years UNIX kernel experience; provide technical innovation while extending System V.4.
- **SENIOR RDBMS PROGRAMMERS**
  5+ years RDBMS experience, 3+ years developing and/or porting RDBMS in a UNIX environment.
- **SENIOR UNIX RDBMS PROGRAMMERS**
  5+ years UNIX kernel and RDBMS experience; performance tuning the interface between RDBMS and UNIX kernel.
- **HARDWARE ENGINEERS**
  3+ years developing firmware and diagnostics for high-performance processors and I/O controllers.

ICL offers attractive benefits and compensation. ICL is an Equal Opportunity Employer M/F/V/H.

For confidential consideration, send resume to: John Fawcett, ICL North America, 9801 Muirlands Blvd., Irvine, CA 92718. Call John Fawcett at (714) 458-7262. Fax transmission upon request.

ICL
AN STC COMPANY

SYSTEMS PROFESSIONALS

Our move to Virginia is creating systems opportunities you won't want to miss!

Mobil, one of the world's preeminent energy companies, prides itself on growing its own talent. However, with the relocation of our Sales & Supply Division to Fairfax, Virginia, exceptional opportunities have been created for experienced:

Project Leaders
Systems Analysts
Programmer Analysts
Business Analysts

To qualify, you'll need a B.S. degree and 3+ years' experience in one or more of the following: DB2, IMS, FOCUS, or COBOL (using embedded SQL).

Our development environment makes extensive use of the Information Engineering Methodology, supporting CASE tools, PC-to-mainframe connectivity, cooperative processing and expert systems.

Mobil's stimulating environment encourages its people to be enterprising and to take risks. If you are a hard working self-starter, possess the technical expertise and the interpersonal and communication skills that will help foster strong working relationships, Mobil would like to consider you for these opportunities.

Call TOLL FREE, 800-848-3683, 24 hours/day, 7 days/week. Or send your resume to: Mobil Oil Sales & Supply Division, Dept. CW, 10310 Main Street, Suite #240, Fairfax, VA 22030. We appreciate your interest in Mobil Oil, but can only respond to those candidates who meet the above requirements.

We are an Equal Opportunity Employer. We encourage women, minorities, the handicapped and veterans to apply.

Mobil

There is no Substitute for Talent.

Talent is more than natural ability. It is a combination of inherent aptitude, motivation, discipline and follow through. It is an attitude.

Talented employees deliver results, give you confidence and peace of mind. CompuSearch Account Executives can deliver these accomplished people to serve you, because finding talent is our talent.

To see what a difference our winning attitude makes, contact Marc Blessing, National CompuSearch Director, at (800) 366-6744. He'll tell you how to get in touch with the CompuSearch talent specialist nearest you.

CompuSearch®

"The biggest news in OLTP is Digital."

On-line Transaction Processing will become the next milestone in a succession of Digital achievements. We have created a new group charged exclusively with the development of OLTP.

Advances in OLTP promise to be exciting and far-reaching and Digital will lead the way.

Because our commitment to transaction processing is firm, we're able to offer the future you want and career paths that move you foward.

Diverse technical challenge in an environment that fosters teamwork—you'll find it at Digital.

OLTP Career Symposium
Tuesday, December 12th
8:00 AM - 7:00 PM
By appointment only

Our top level Technical Hiring Managers are eager to meet experienced software professionals who are looking for the opportunity to work on complex and unusual software problems. You will be called on to support our country-wide Software Services team — helping to provide software development and consultation services in areas where traditional methods have not resulted in a solution.

We are looking for software professionals with a minimum of 5-7 years' design and implementation experience in one or more of the following areas:

- **Shop Floor Automation**
- **Financial /Commercial Systems**
- **Purchasing/Inventory Control**
- **Trading Systems**
- **Distributed Processing**
- **ACMS**
- **CICS/DECintact***
- **IDMS**
- **DB2**
- **ORACLE****
- **INGRES*****
- **Rdb**

To highlight your OLTP background, please fax your resume to (708) 806-2483. Be sure to include your contact information—a Digital representative will get back to you in one working day!

If you are unable to fax your information, please send your resume to: **Linda Brubaker, Dept. 1113-9804, Digital Equipment Corporation, 100 Northwest Point Blvd., Elk Grove Village, IL 60007. Principals only.**

*Trademark of Digital Equipment Corporation.
**Trademark of Oracle Corporation.
***Trademark of Relational Technology, Inc.

We are an affirmative action employer

Digital has it now.

SAUDI IRON AND STEEL COMPANY (HADEED)

HADEED offers an excellent employment package including 2-year renewable contracts, free accommodations, medical package, car allowance, air tickets, 6 weeks annual vacation, attractive salary, completion bonus, assistance with schooling, etc. all in a pleasant Gulf coast location.

HADEED is the largest Iron and Steel producer within the Kingdom of Saudi Arabia with over 2,000 employees.

PROJECT LEADER (Circa $48,000)

To lead a team of Programmers/Analysts responsible for new development projects as well as maintenance of existing applications. Effective communicative skills combined with a good COBOL background is essential. DBMS (e.g. INFORMATION, ORACLE) and on-line experience in a mini environment would be ideal.

Candidates should have a minimum of 8-10 years of relevant experience of which the last 2-3 years were in a leadership role and with at least two medium sized projects from initial design through to implementation.

BUSINESS ANALYST (Circa $41,800)

To conduct structured business and computer analysis, producing functional specifications reflecting user needs to form the basis for systems development. To control system testing, implementation, and the development of user procedures.

Candidates should have a minimum of 5 years experience in a manufacturing environment with previous knowledge in the areas of accounting, budgeting, production, preventative maintenance and workshop systems.

PERSONAL COMPUTER SUPPORT SPECIALIST (Circa $38,400)

To support the operational auxiliary systems including PC's graphics and word processing. To evaluate hardware and software requirements for support systems.

Candidates should have a minimum of 5 years relevant experience, good communication skills, and working knowledge of all PC hardware components and major software products. Should include knowledge of popular PC brands (IBM, AST, COMPAQ, SEAGATE, etc.) and NOVELL LAN configurations.

PROGRAMMER ANALYST (Circa $38,400)

To work as a senior member of a development team on the specification, programming and implementation of a variety of manufacturing, accounting or MIS Systems.

Candidates should have a minimum of 5 years recent experience in COBOL, on-line and database systems. (machine used in PRIME 6350)

Candidates should be educated to degree level or equivalent in accounting, operational research, computer or general science.

Please send resumes to Paul Kenkel, MIDDLE EAST RECRUITERS, 27132A Paseo Espada No. 402-116, San Juan Capistrano - CA - 92675 *or call* (714) 364-3632.

YES, I want to receive my own copy of COMPUTERWORLD each week. I accept your offer of $44.00* per year — a savings of 57% off the single copy price. In addition, I'll receive special bonus sections of COMPUTERWORLD Focus on Integration.

First Name MI Last Name

Title Company

Address

City State Zip

Address shown: ☐ Home ☐ Business ☐ New ☐ Renew Basic Rate: $48 per year

*U.S. Only. Canada $110, Central/South America $130, Europe $195, all other countries $295. Foreign orders must be prepaid in U.S. dollars.

Please complete the information to the right to qualify for this special rate.

COMPUTERWORLD

1. **BUSINESS/INDUSTRY** (Circle one)
   - 10 Manufacturer (other than computer)
   - 20 Finance/Insurance/Real Estate
   - 30 Medicine/Law/Education
   - 40 Wholesale/Retail/Trade
   - 50 Business Service (except DP)
   - 60 Government - State/Federal/Local
   - 80 Communications Systems/Public Utilities/Transportation
   - 70 Mining/Construction/Petroleum/Refining/Agric
   - 90 Manufacturer of Computers, Computer-Related Systems or Peripherals
   - 85 System Integrators, VARS, Computer Service Bureaus, Software Planning & Consulting Services
   - 95 Computer/Peripheral Dealer/Distr./Retailer
   - 75 User: Other _____
   - 99 Vendor: Other _____ (Please specify)

2. **TITLE/FUNCTION** (Circle one)
   IS/MIS/DP MANAGEMENT
   - 10 Chief Information Officer/Vice President/Asst. VP IS/MIS/DP Mgt.
   - 21 Dir./Mgr. MIS Services, Information Center
   - 22 Dir./Mgr. Tech. Planning, Adm. Svcs., Data Comm., Network Sys. Mgt., Dir./Mgr. PC Resources
   - 23 Dir./Mgr. Sys. Development, Sys. Architecture
   - 31 Mgrs., Supvr. of Programming, Software Dev.
   - 32 Programmers, Software Developers

   OTHER COMPANY MANAGEMENT
   - 11 President, Owner/Partner, General Mgt.
   - 12 Vice President, Asst. VP
   - 13 Treasurer, Controller, Financial Officer
   - 41 Engineering, Scientific, R&D, Tech. Mgt.
   - 51 Sales & Mktg. Mgt.

   OTHER PROFESSIONALS
   - 60 Sys. Integrators/VARs/Consulting Mgt.
   - 70 Medical, Legal, Accounting Mgt.
   - 80 Educator, Journalists, Librarians, Students
   - 90 Others _____ (Please specify)

3. **COMPUTER INVOLVEMENT** (Circle all that apply)
   Types of equipment with which you are personally involved either as a user, vendor, or consultant
   - A. Mainframes/Supermins
   - B. Minicomputers/Small Business Computers
   - C. Microcomputers/Desktops
   - D. Communications Systems
   - E. Office Automation Systems
   - F. No Computer Involvement

E4946-0

YES, I want to receive my own copy of COMPUTERWORLD each week. I accept your offer of $44.00* per year — a savings of 57% off the single copy price. In addition, I'll receive special bonus sections of COMPUTERWORLD Focus on Integration.

First Name MI Last Name

Title Company

Address

City State Zip

Address shown: ☐ Home ☐ Business ☐ New ☐ Renew Basic Rate: $48 per year

*U.S. Only. Canada $110, Central/South America $130, Europe $195, all other countries $295. Foreign orders must be prepaid in U.S. dollars.

Please complete the information to the right to qualify for this special rate.

COMPUTERWORLD

1. **BUSINESS/INDUSTRY** (Circle one)
   - 10 Manufacturer (other than computer)
   - 20 Finance/Insurance/Real Estate
   - 30 Medicine/Law/Education
   - 40 Wholesale/Retail/Trade
   - 50 Business Service (except DP)
   - 60 Government - State/Federal/Local
   - 80 Communications Systems/Public Utilities/Transportation
   - 70 Mining/Construction/Petroleum/Refining/Agric
   - 90 Manufacturer of Computers, Computer-Related Systems or Peripherals
   - 85 System Integrators, VARS, Computer Service Bureaus, Software Planning & Consulting Services
   - 95 Computer/Peripheral Dealer/Distr./Retailer
   - 75 User: Other _____
   - 99 Vendor: Other _____ (Please specify)

2. **TITLE/FUNCTION** (Circle one)
   IS/MIS/DP MANAGEMENT
   - 10 Chief Information Officer/Vice President/Asst. VP IS/MIS/DP Mgt.
   - 21 Dir./Mgr. MIS Services, Information Center
   - 22 Dir./Mgr. Tech. Planning, Adm. Svcs., Data Comm., Network Sys. Mgt., Dir./Mgr. PC Resources
   - 23 Dir./Mgr. Sys. Development, Sys. Architecture
   - 31 Mgrs., Supvr. of Programming, Software Dev.
   - 32 Programmers, Software Developers

   OTHER COMPANY MANAGEMENT
   - 11 President, Owner/Partner, General Mgt.
   - 12 Vice President, Asst. VP
   - 13 Treasurer, Controller, Financial Officer
   - 41 Engineering, Scientific, R&D, Tech. Mgt.
   - 51 Sales & Mktg. Mgt.

   OTHER PROFESSIONALS
   - 60 Sys. Integrators/VARs/Consulting Mgt.
   - 70 Medical, Legal, Accounting Mgt.
   - 80 Educator, Journalists, Librarians, Students
   - 90 Others _____ (Please specify)

3. **COMPUTER INVOLVEMENT** (Circle all that apply)
   Types of equipment with which you are personally involved either as a user, vendor, or consultant.
   - A. Mainframes/Supermins
   - B. Minicomputers/Small Business Computers
   - C. Microcomputers/Desktops
   - D. Communications Systems
   - E. Office Automation Systems
   - F. No Computer Involvement

E4946-0

NO POSTAGE
NECESSARY
IF MAILED
IN THE
UNITED STATES

BUSINESS REPLY MAIL
FIRST CLASS PERMIT NO 55 MARION, OH 43306

POSTAGE WILL BE PAID BY ADDRESSEE

COMPUTERWORLD

P.O. Box 2044
Marion, Ohio 43306-2144

NO POSTAGE
NECESSARY
IF MAILED
IN THE
UNITED STATES

BUSINESS REPLY MAIL
FIRST CLASS PERMIT NO 55 MARION, OH 43306

POSTAGE WILL BE PAID BY ADDRESSEE

COMPUTERWORLD

P.O. Box 2044
Marion, Ohio 43306-2144

Our systems are up. So log in.

Bring us your computer language skills, a talent for communication, and the desire to do something important and we'll give you an opportunity to make a significant contribution.

Because right now, Boeing Computer Services, a division of The Boeing Company, is looking for the brightest people to help us provide world-class information services to hundreds of commercial and government customers.

We're growing, expanding and doing important work in a broad range of computing disciplines.

So check out the opportunities. If your skills and experience match our requirements, get in touch.

Here's What We Need

The following positions require an EE, ME, or BS or Computer Science degree and appropriate industry experience. We will also consider talented entry-level engineers and computer specialists with advanced degrees.

Applications:
Financial, Manufacturing, Engineering, Logistics, Embedded Software, Expert Systems, CAD/CAM, Neural Networks

Software Packages:
CATIA, McCormick-Dodge, Microsoft Windows, CASE tools, X Windows, Powerhouse/Trans Act

Hardware:
IBM, CRAY, HP, DEC/VAX, Apollo, SUN, TANDEM, WANG/VS

Communications:
LAN, Network Architecture, Novell, X.25, MAP/TOP, Ungerman Bass, Cable Plant Engineer, Protocol Layer Evaluation/Design, Network Hardware

Language Experience:
Ada, C, COBOL, Fortran, PL/1, SQL, Pascal, Assembler/BAL

Operating Systems:
MVS, UNIX, CICS, DOS, VMS, NOS, CDS

Database Experience:
IMS, DB2, Microrim, Ingres, Paradox, ORACLE

Software Engineering Skills:
Data Modeling/Data Management, DOD Standard 2167, System Architecture, Software Testing, Systems Engineering, Capacity Planning/Performance Tuning, Integration Engineering

Operating Systems Analysts:
Experience in operating systems of IBM, Digital (8000 series) and HP (3000 and Spectrum series).

Factory Automation Software Development:
Integrated OSI communications (MAP/TOP), manufacturing and business operations in a CIM environment which makes exclusive use of multi-vendor platforms (digital, HP, Intel, LAN & WAN systems).

IMS Programmer Analysts:
Experience designing, coding and implementing on line and batch business systems in an IBM mainframe environment. Proficiency in COBOL, IMS DB-DC, JCL, and TSO/ISPF required. Knowledge and experience with Micro Focus workbench a plus.

IMS Data Base Administrators:
Command of all IMS data base related functions. Performance analysis, space management, problem resolution and logical/physical data base design skills are essential.

IBM 8100 Programmer/Analyst:
Requires proficiency in use of IBM 8100 hardware and software products. Desirable experience includes DPPX/SP operating system. DPPX/COBOL, DTMS, TSO, CLISTS, host communication facilities and structured programming.

Programmer/Analyst:
Programming experience using Tandem computers, knowledge of COBOL, SCOBOL, DDL, Inspect, Enable, TMF, and Pathways required. SQL and TAL background a plus.

NC Programmer For 3-Axis Machines:
APT language for interactive graphics programming on CAD/CAM. CATIA experience a plus.

Operating Systems Programmer:
Internals experience in one or more of UNIX, MVS, VMS, NOS, or COS operating systems. Ability to solve system dumps and design new operating system products.

Here's What We Can Do For You

These positions offer excellent growth potential along with the right salary, relocation assistance and these benefits:

- Company-paid plans for Health Care, Vision, Dental, Retirement
- Company-sponsored Training Programs (on/off hours)
- Investment Plans (VIP/FSP)
- Continuing Education Program (reimbursable)
- Employee Suggestion & Cost Improvement Programs

We can offer you another plus—a chance to share a quality lifestyle in the beautiful Pacific Northwest. Near Seattle, the number-one ranked city for recreation, and one of the nation's most livable cities, as wil.

Here's How To Get In Touch

If you have what it takes to make our team, please send your resume, with current and expected salary, to *Boeing Employment Office P.O. Box 3707-PBP, Seattle, WA 98124.* Principals only.

Or fax your resume to our 24-hour fax line in strictest confidence: 1-800-525-1036.

Please note on your resume which job you are interested in.

An equal opportunity employer.

BOEING

FINANCIAL SYSTEMS INFORMATION PROFESSIONALS

Hogan Systems, Inc., America's leading supplier of application software to financial institutions, currently has several outstanding career opportunities available

INTEGRATED BANKING APPLICATIONS (IBA)

Positions available in consulting (U.S. and International), development, and support of Hogan IBA Systems. Current openings exist for:

- **Business Analysts**
- **Educators/Trainers**
- **Project Managers**
- **Technical Analysts/ Programmers**

Requirements for these positions include a thorough knowledge of financial systems. In addition, experience with Point of Sales, Credit Card, Debit Card, Merchant Servicing or Branch Delivery Systems is preferred. Some positions require international relocation or travel within the United States. Foreign language familiarity a plus.

INTERNATIONAL MONEY MARKET SYSTEM (IMMS)

The following opportunities exist within Hogan's IMMS Software Product Division:

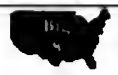
BUSINESS ANALYSTS—Requirements for these positions include experience with foreign exchange, money market, international loans and risk management applications or international banking operations. In addition, candidates must possess excellent communication and analytical skills.

ANALYST/PROGRAMMERS—Positions require a minimum of 3 years experience with financial applications using IBM MVS/XA, COBOL, CICS, DL1 and/or DB2. A strong aptitude for resolving complex business and technical problems is also required.

Hogan Systems offers an excellent salary and a comprehensive benefits package. Please send your resume to **Betty Brown, Hogan Systems, Inc., Dept. CW1115, 5000 Spectrum Drive, Dallas, TX 75248** or **FAX (214) 788-7991.** Please specify position for which you are applying. Equal Opportunity Employer.

Hogan SYSTEMS

Software Engineering Consultant to participate in selection of software development methodology & tool support, for projects covering wide spectrum of application, from information processing to complex real-time systems. All aspects of development must be addressed, including estimation, project management, requirements analysis, functional specification, design, code & test, using software development methodologies & tools & produce supporting technical documentation. Applying proven track record in preparation & delivery of technical training courses & demonstrated effective oral & written communication skills. Must have MS or higher in Science or Engineering & 1.5 yrs experience in either job offered or a software engineering position involved in real-time development. The required experience must include using software support tools for projects ranging in application from information processing to real-time systems and covering all aspects of the software development process, and supervision of at least one software development effort of at least 5 man-years in size, involving real-time graphics application. Salary is $47,800/yr for 5 day, 40 hr wk. Apply by resume only to - Job Service of Florida, 105 East Broward Blvd., Ft. Lauderdale, Florida 33301. ATTN: Job Order #FL0188731S. EOE



EIS Comshare Professionals

$30,000 - $70,000+

Join the exciting field of consulting with a prestigious "BIG EIGHT" firm. Top salaries and benefits are available in most major cities. RUSH resume to:

Donald C. Thomas & Associates, Inc.
1410 N. Westshore Blvd. #806
Tampa, Florida 33607
Specialized IBM Personnel Services

A KEY CONNECTION FOR CAREER GROWTH

Community Health Computing makes key connections for better healthcare delivery. CHC serves the "Who's Who" of the hospital community with innovative information systems. Since 1973, we have sought solutions for expanding data integration in medical facilities. Today, we stand on the brink of a new challenge. Be part of our commitment to provide the highest quality products and services as we prepare to enter new markets in hospital computerization.

SOFTWARE ENGINEERS

A BS degree in Computer Science (or equivalent) is required. 5+ years of proven leadership should include several of the following: large, complex commercial software products (using top down development and design methodologies) from concept to market; structured lifecycles; varied software environments (including transaction processing and multi-tasking); product component walk-through/inspections; C, Fortran, Pascal and PL/1. Also a plus is work with clinical application design and development, Stratus systems, integration testing design and execution as well as logical and relational database design.

CLIENT SERVICE REPRESENTATIVES

Work in one of two key areas to foster good CHC customer relations. Our first-line Client Service Representatives assist customers in solving software product problems requiring immediate attention. Our second line of software product experts assist in more in-depth investigations. For both of these positions, we prefer 3-5 years experience in healthcare and computerization.

Be a vital member of our team in Houston—where the spirit of optimism is driving a comeback economy. You'll enjoy a highly affordable cost of living in a vibrant, international city. Our benefits include medical/dental insurance, flex account, tuition reimbursement, 401K and relocation assistance. Send your resume to:

COMMUNITY HEALTH COMPUTING
Director of Human Resources
5 Greenway Plaza, Suite 2000
Houston, TX 77046

CHC Community Health Computing

US AGENT REQUIRED

National Agent required for 4th-Write, FOCUS Application Documentation Tool. Runs with FOCUS on VM & MVS. Would consider outright sale of product.

Tower Systems
PO Box 299
ST KILDA VIC 3182 AUSTRALIA
PH: +61 3 537 2811
FAX: +61 3 534 9296

Sunbelt Opportunities

CICS Programmer I (MVS or DOS)	30-35K
S/38 AS/400 Programmer (RPG III)	25-30K
*INGRES Programmer	30-38K
HP 3000 Programmer (COBOL)	30-35K
3270 SDLC Programmer	30-40K
MSA or MAD Systems Analyst	35-45K
Basis Programmer I or Sys. Analyst	30-45K
Mfg Sys. Analyst	35-42K
Retail Programmer	30-35K
Insurance Programmer	30-35K
ADS/ENDEVOR Programmer (IBM)	25-34K
ADABAS/NATURAL Programmer	30-38K
SMACC / SAS Programmer	25-30K
VAX Programmer / Sofe Engr	32-40K
FOCUS Programmer	25-35K
CICS ADS/E Programmer	25-30K
IMS DB/DC Programmer	25-30K
PL/1 Programmer (VSE or MVS)	30-38K
Accounting Sys Analyst	35-40K
EDP Auditors	33-43K

Charlotte's largest executive search firm in business since 1971. 300 clients. We place candidates in the Southeast and nationwide. Our entire compensation are reasonable and reimbursed expenses. Call our firm.

Corporate Personnel Consultants
5705-320 Lando Drive, Box 271720
Charlotte, NC 28227 (704) 366-1600
Attn: Rich Young, C.P.C.

MIS Manager

Organized individual to manage distributed data & mainframe analysis, design & programming in small VAX environment. Excellent growth opportunity for talented self-starter. Track record & good people skills.

This is a job for ROMAC.

Quality personnel are the key to effective data processing and MIS operations within any company. And ROMAC can staff your company with just such personnel – highly skilled computer operators, software engineers, computer operation managers, programmers – every type of DP professional.

For 23 years, our offices have been finding skilled professionals and matching their capabilities to the needs of leading companies – large and small.

ROMAC attracts the best candidates for your positions because we're specialist. We understand the requirements of the job so that we can send you the most qualified DP professionals. And because of our success in locating top flight personnel, the leading companies offer their best positions through ROMAC.

So come to ROMAC first for qualified specialists for your permanent staff.

ROMAC.

Prime franchise locations available. For information call Jerry Gignere at 1-800-341-0393.

PC SPECIALISTS

If you are looking for an exciting and rewarding environment to develop PC based software, we have a marvelous opportunity for you. The successful candidate will have a BS degree and 5-10 years experience in:

- *Windows*
- *C*
- *DataBase*
- *Token Ring*

We are an established and fast growing computer solutions company. If you are a top achiever with a proven record, send or fax your resume in confidence to:

System Innovators, Inc.
2301 Lucien Way, Suite 170
Maitland, FL 32751-7010
FAX (407) 875-8711

FLORIDA

MSA Trainer

for a major national organization headquartered in Washington, D.C.

See our advertisement on page 129 of this issue.

Price Waterhouse

SYSTEMS PROGRAMMER

We are a Blue Shield Plan seeking a person with solid work experience as a systems programmer supporting an IBM environment. Our Management Information Systems Department utilizes an IBM 4381, MVS/XA, CICS, NETVIEW, VTAM, NCP, COBOL, and CA1-7-11. We also use CINCOM's SUPRA database and other software products. Position responsibilities consist of installing and maintaining IBM and other vendor software products as well as providing technical advice and assistance to MIS staff. We offer an excellent salary and fringe benefits package, plus education and training programs. Experienced applicants are encouraged to submit a resume with salary history in confidence to:

Pierce County Medical
Manager, Human Resources
9114 Breeding Plaza
Tacoma, WA 98402

Non-smokers only
AA/EOE

CICS ULTRA MANTIS SPECTRA SUPRA IMS DB2

The Missing Piece(s)?

A career isn't easy to put together. Often it's a matter of making do with inadequate pieces. But you're worth more than that.

At SORDYL & ASSOCIATES you will work for a leader in the field of custom applications development. Our employees enjoy the professional recognition and variety of assignments only a consulting firm can offer, excellent compensation and benefits, and advancement based on performance.

Specific needs in the following areas:

MANTIS CICS
DEC/VAX COBOL

If you have at least 3-5 years IBM or VAX programming experience and the drive to be the best, you owe it to yourself to contact us. Requirements in the East and Midwest. Call collect or drop us a line...we have a lot to talk about.

Sordyl & Associates Inc.

Robert B. Fields, Director, Regional Operations
105 Mall Blvd., Suite 272-E, Monroeville, PA 15146
Call Collect (412) 856-1730

The Facts: Pure & Simple

1. USAA total assets top $14 billion
2. The USAA organization includes 35 subsidiaries, 19 affiliates, and 25-plus satellite offices
3. USAA employees now number 11,000
4. USAA is the nation's largest mail order business in terms of sales and volume
5. USAA is one of San Antonio's largest private employers
6. Forbes calls USAA "A place where the financial supermarket—a one-stop shop for everything from stocks to life insurance—really works."

FACT IS, USAA is a very impressive organization, and we're very proud of our achievements. Our goals for the future are no less impressive: We plan for more of the same—success that results from a dedication to quality in products and services through employees who share our commitment to excellence. If you're interested in joining a company where the facts tell the real story, consider these current opportunities:

PROGRAMMER ANALYST/ SYSTEMS ANALYST

Opportunities exist for individuals possessing one or more of the following skills:

- Strong analytical, technical and interpersonal skills
- Applications experience in areas such as: Financial, General Ledger, Accounting, Loss Reserves
- Proven development expertise in a "Team Concept Approach"
- CASE and Application Development Productivity Tools
- PRIME experience in the Telecommunications arena
- Proven experience in: IBM mainframe environment—3090, MVS /XA, TSO, IMS, DB2, ISPF, PS2, PL1, COBOL, EASYTRIEVE, CICS

CLAIMS SYSTEMS PROGRAMMER ANALYST/ SYSTEMS ANALYST

Requires 3-5 years Property & Casualty Claims insurance applications with a strong background in large system development in the following areas:

- IBM mainframe environment—3090, MVS/XA, TSO, IMS, DB2, ISPF, PL1, COBOL, EASYTRIEVE
- Systems analysis skills to include use of structured methodology, writing specifications, design and analysis, and user interface.

Qualified candidates please send resume to:

USAA
USAA Building
San Antonio, Texas 78288-0055
Attn: Employment & Placement/
SD/TLL/CW 1113

USAA

An Equal Opportunity Employer, M/F
Principals only, please

A Terrific Opportunity

Computer Consulting Group, one of the Southeast's fastest growing contract programming and consulting firms, has immediate openings for talented Programmer/Analysts with 2 or more years experience. Excellent salary & benefits package. We're especially seeking

- IBM/VSE/FORTRAN
- VAX/VMS
- ADS/Online
- IDMS/DB/DC
- DEC/ADABAS/RPG
- UNISYS/COBOL
- IDMS/ADSO/V
- GALILEO
- INTERGRAPH
- DECNET/VMS
- ADABAS/NATURAL
- VAX DTS/DBMS
- VM/MS DOS/VSE
- AS 400/RPG II
- DOS DTS PASCAL
- TEXAS INSTRUMENTS
- HP 9000/C/ASSIST

Computer Consulting Group
Contract Professional Services

Research Triangle Area
4109 Wake Forest Rd
Suite 307
Raleigh, NC 27609
1-800-222-1273
(803) 738-1994
FAX (803) 738-9123

MANAGER, Electronic Data Interface

Borden, Inc., a Fortune 100 food and specialty chemicals company, seeks a Manager—Electronic Data Interface to implement and oversee UCS-EDI (DEX-NEX) for the Snacks and International Consumer Products Division.

This position is responsible for North American UCS-EDI planning, design, and implementation—including training, procedures development, and ongoing operations—for hardware, software, data communications, applications, and UCS—EDI standards.

This is an excellent opportunity for a person with seven to ten years of experience across all disciplines of Information Resources Management. Working knowledge of handheld computers, network UCS, and personal computers is essential. In-depth implementation experience with UCS-EDI in a direct-store-delivery (DSD) environment and exposure to S/3x and AS/400 are very desirable. Good oral and written communications will be very important.

We offer an attractive salary commensurate with your qualifications and an outstanding benefits package which includes a matching savings plan. To apply in confidence, please send your resume to: Professional Staffing Dept. CW

Borden, Inc.
180 E. Broad Street
Columbus, Ohio 43215

BORDEN

An Equal Opportunity Employer M/F/H/V

AS/400 S/38

THE PROFESSIONAL'S CHOICE...

...a Whittman-Hart, the largest diversified technical services company (dedicated strictly to the AS/400 and S/38 systems) in the country. We provide technical support to many of the top Fortune 20 companies in America. We are a team of experts, mastering technologies, executing details and finding solutions. Our accelerated growth and phenomenal success has created a need for talented Data Processing PROFESSIONALS to share in a future of significant challenge and reward in a highly progressive team environment.

Our current need requires individuals with 2+ years solid System 36, RPG III/COBOL experience and proficiency in any of the following:

- Technical Consulting
- Data Communications
- Design
- Project Management
- Education & Training
- Product Development

Whittman-Hart offers one of the finest compensation packages in the industry, including high earnings potential, project diversity, insurance, paid insurance coverage, relocation allowance and other exceptional benefits. Please send your resume in strict confidence to: Jared Bahr, Manager of Recruiting, Whittman-Hart, INC., 377 East Butterfield Road, Suite 390, Lombard, IL 60148, (312)971-2270.

Whittman-Hart
The Leader in the Midrange Solutions.

Equal Opportunity Employer M/F

QUESTAR PARTNERS

has immediate openings for computer professionals:

- **SECURITY MANAGER** - 5 yrs. exp. with data security software packages. UNIX/IBM Syst. 36 IBM & DEC MF. Top Secret (CA) preferred.
- **SYSTEMS TEST MANAGER** - 5 yrs exp in applications software testing of business systems. "C" program background, teams supervision.
- **DATA BASE DESIGN ANALYST** - 5 yrs. exp. in data modeling in Ingres.

Excellent salaries & benefits with major US Corp. in Nashville, TN.

Resumes or calls to JAMES STRONG, (615) 371-8805, 105 Westpark Road, Suite 200, Brentwood, TN 37027

CALL OUR NEW AND IMPROVED 24 HOUR ON-LINE CONTRACT AND PERMANENT JOB LISTINGS

919-222-0979
PLEASE TELL YOUR DP FRIENDS ABOUT IT!

DP RESOURCES, INC.
P O Box 8957
Burlington, NC 27216-8957

DIRECTOR OF DATA PROCESSING

Well established college located in Davenport, Iowa needs an experienced data processing manager. The successful candidate will have proven data processing administrative experience with a multi-department service organization.

Requirements include minimum of 10 years data processing experience with minimum 3 years supervisory experience in a large data center environment. DEC VAX (VMS) and PC Network experience preferred. Qualified candidate will have bachelor degree in computer science or business related field.

Position will have overall responsibility for both administrative and academic systems and will report to the Vice President of Business Affairs. Competitive compensation package available.

Send resume in confidence to:

CW-17345
Computerworld, Box 9171
Framingham, MA 01701-9171

Senior Computer Systems Analyst wanted to analyze complex systems requirements, and, design, develop and implement software for on-line systems for purchasing, materials management and interfacing to financial systems using UNISYS large systems, DMS II, on-line MCS, like GEMCOS, COBOL, ALGOL, IBM & VAX machines and relational DBMS like ORACLE/INGRES. Requires B.S. degree in Electronics & Telecommunications Engineering or Computer Engineering and two years experience in the job offered or two years related experience as a Computer Systems Analyst or Computer Software Engineer. $48,000.00 per year; 40 hours per week. Send resume to 7310 Woodward Ave, Room 415, Detroit, MI 48202. Ref. #78188 "Employer Paid Ad"

Computer Systems Analyst wanted to analyze complex systems requirements, and, design, develop and maintain information systems for clients; systems external specification, internal specification, coding and testing XGEN/COBOL programs; maintenance of systems on UNISYS large systems & PC's. Requires B.S. degree in Computer Science and two years experience in the job offered or two years related experience as a Computer Programmer or Computer Software Engineer. $39,000.00 per year; 40 hours per week. Send resume to 7310 Woodward Ave, Room 415, Detroit, MI 48202. Ref. #78189 "Employer Paid Ad"

MEMPHIS/ MID-SOUTH

Currently located in National client base. Specializing in the placement of data processing professionals qualified for positions in the IBM-MIDRANGE environment. Clients pay our fees, provide relocation and other great career opportunities.

ROMAC
Professional Recruiters
6550 Poplar Avenue, Suite 340
Memphis, TN 38119
(901) 685-5600 FAX (901) 684-1600
Darlene R. Murphy, Partner

Senior Computer Systems Analyst wanted to analyze complex systems requirements, and, design, develop and implement purchasing or financial systems software using COBOL, IDMS, DMDC, OCL, JCL, TSO/CLISTS, IBM 3090/4300 series under MVS or VM/CMS, Structured Systems Analysis & Design and CASE tools. Requires Bachelor's degree in Computer Engineering or Electronics & Communications Engineering and two years experience in the job offered or two years related experience as a Computer Systems Analyst or Computer Software Engineer; $44,000.00 per year; 40 hours per week. Send resume to 7310 Woodward Ave, Room 415, Detroit, MI 48202. Ref. #78186 "Employer Paid Ad"

Computer Software Engineer wanted to analyze complex systems requirements, and, design and develop various software using UNISYS A Series, BNA/V2, COMS, DMS II, DCAL/GOL and CP2000 front end processor, and, systems support of UNISYS large systems and message switching applications for leased networks. Requires B.S. degree in Computer Science or Computer Engineering and two years experience in the job offered or two years related experience as a Computer Systems Analyst; $48,280.00 per year; 40 hours per week. Send resume to 7310 Woodward Ave, Room 415, Detroit, MI 48202. Ref. #78188 "Employer Paid Ad"

Assembler Programmers

Macrochallenges await macro-geniuses

If you're a results-oriented pro who thrives on challenge and possesses strong macro-CICS experience, you could be part of a developmental project in a whole new technology. One that involves creating high speed telephonic applications software that is transforming Alexander Graham Bell's invention into the talk of the 21st Century.

Specifically, we're referring to a joint venture of American Express Information Services Company and AT&T Together, they have created Call Interactive, a revolutionary new information service that melds telemarketing principles with advanced communications networking capabilities.

Working in an extraordinary environment which utilizes IBM 3090 and Amdahl 5990 processors running CICS and MVS/XA, you will design, code and test specialized software programs for generic systems. You will also tailor these to specific clients' needs, and modify and update the campaigns as needs and technology change.

The scope of the assignments demand a minimum of 2+ years' on-line assembler programming experience with macro-level CICS. Familiarity with CICS Tables and Control Blocks are essential.

The professional advantages of tackling projects that will define this exciting new technology are enhanced by an array of personal ones. Based in Omaha, Nebraska, you will enjoy a high quality life-style in an area known for its low cost of living. It's the perfect balance, especially when you take into account the excellent school system and the vast beauty of the plains.

If your background is macro-CICS, it doesn't get any bigger or better than this. Arrange an immediate interview by sending a resume in confidence to: CALL INTERACTIVE, 2102 North 117th Avenue, Suite 300, Dept. AP, Omaha, NE 68164 or call Jeff Bronsteter at (402) 498-7252.

CALL INTERACTIVE SM

A joint venture of American Express Information Services Company and AT&T.

Equal Opportunity Employer

PROGRAMMERS

First Commerce Corporation, a $4.2 billion asset bank holding company, has excellent opportunities for Programmers with one or more of the following skills or backgrounds:

- COBOL/CICS programming
- TANDEM/COBOL programming
- PC Network
- Systems Analyst experience on bank applications

The successful candidates will also have:

- College degree, preferably in Computer Science or Math
- Excellent communications skills
- Ability to interface with users and vendor technicians

First Commerce Corporation offers a competitive salary and excellent flexible benefits program.

Please submit a resume to:

First Commerce Corporation
Human Resources Department
P.O. Box 60279
New Orleans, LA 70160
Attention: Recruiter P

An Equal Opportunity Employer

FIRST COMMERCE

When the business card says AGSL, it says a lot about you.

It says you're among the very best at software consulting, programming and project work for Fortune 500 companies. And your biz associated with a consulting firm that enjoys a 95% call-back rate from those clients.

It says you've got years of experience and mastery of DB2, PL/I, COBOL / CICS, IDMS, UNISYS, IMS DB/DC, AS/400, or (PMS) Policy Management Systems.

If you've been waiting for this kind of opportunity, we've got a card waiting for you. For confidential consideration and interview, please contact (mail, fax or phone) your resume and salary history to:

Atlanta Group Systems, Inc.
2971 Flowers Rd. South • Suite 275 • Atlanta, GA 30341
(404) 455-7783 1-800-768-2474 FAX: 1-404-451-5163
ATTN: Rex Alford

Or contact our Greenville Office at 135 Interstate Blvd. Suite 2A • Greenville, S.C. 29615 (803) 234-7668

Equal Opportunity Employer

DB2 DATA BASE ADMINISTRATOR

Large oil and gas company seeks individual with strong DB2 data base administration background. PL/1 or COBOL is required. TSO/SPF and IMS DB/DC would be desirable. Salary negotiable. Fee paid.

LIVE ON THE COAST

Gulf Coast firm has urgent need for programmer analyst. This individual will interface with all levels of users. PL/1 & VM/CMS required. Company has exceptional benefits & will relocate. Salary to $35,000.

SR CONSULTANT

Client has urgent need for several analysts. Degree a must along w/COBOL, CICS, DB2, TELON and/or MSA. Career path to mgmt. available. To $45,000. FEE PD.

UNIVERSITY SERVICE
1200 Post Oak Blvd.
Houston, Texas 77056
800-880-1094

SYSTEMS ANALYST

wanted. Duties: Generally, analyzing client data processing requirements and computer hardware then designing, developing and implementing a computer system which will process the client's data in the most timely and inexpensive manner on that hardware. Specific duties include reviewing the invoice reporting system with check point/restart facilities and studying and redesigning it in order to cater to the changing needs of the system using the following hardware, software and languages: IBM 3090 MVS/SESA, DB2, IMS, DB/DC, JCL and COBOL. Need Bachelor's in Computer Science, Engineering or Business Administration and two years exp as System Analyst or Programmer Analyst. Experience must include designing, developing and/or implementing business applications software using the following hardware, software and languages: IBM 3090 mainframe, MVS, IMS DB2 and COBOL. Pay is $38,000 per year. 40 hr/wk. Resumes to 7310 Woodward Ave., Rm 415, Detroit, MI 48202. Ref. #71488. Employer Paid Ad.

CONTRACTORS

Min. 2 years experience:

- ROMAD
- C, UNIX
- ORACLE
- TELON, DB2
- 2-WINDOWS
- ADABAS, Natural 2
- SUPRA, MANTIS
- MAS, MILLIMAN
- HR PAYROLL

Please call, fax or mail resume to:

PAR, INC.
3100 Monticello, Suite 600
Dallas, TX 75205
(214) 841-3111
OR
PAR, INC.
4615 S.W. Fwy, Suite 400
Houston, TX 77027
(713) 622-3711
FAX (713) 622-3778

It's Not A Good Match . . . Unless You're In TANDEM

You and CoreStates working together—developing new systems for electronic funds transfer, ATM, point-of-sale processing and PC connectivity.

If TANDEM is your specialty, you could work with us. We'll provide you with all the technical and administrative support you'll need to help us set the pace for the next breakthrough in electronic banking. We currently have TWO Programmer/Analyst positions available to work in our exciting, advanced developmental environment.

ATM and POS NETWORKS — CoreStates owns and operates the largest regional ATM network in the nation. We are MAC. And we service more than 800 financial institutions in seven states while increasing our network every year.

IFT SYSTEM — Integrates and automates our wholesale electronic payments system, allowing us to automatically monitor and control the flow of large dollar transactions in a real-time environment.

Both positions require experience with non-stop TANDEM architecture supporting on-line transactional processing applications. TAL language skills are highly desirable. A background in data communications and/or applications would be a plus.

Interested? Consider all the benefits a CoreState's career will bring you. Send your resume with salary history/requirements to: Vicki Brown, CoreStates Human Resources, F.C. 2-2-6 TNDM, P.O. Box 7618, Philadelphia, PA 19101-7618. An equal opportunity employer.

CoreStates

DATA PROCESSING PROFESSIONALS

Experienced DP professionals needed for various long-term assignments in the following environments supported by our CHATTANOOGA, TN; COLUMBIA, SC; ATLANTA, GA; RALEIGH, NC and CHARLOTTE, NC Offices.

IBM
- DB2, PL/1, CICS
- C, MVS, PC-DOS
- McCormack & Dodge Payroll
- AS400, COBOL

DEC
- VAX, ORACLE, SQL
- Rdb, FORTRAN
- INGRES, FORTRAN
- DCL, DMS, VMS
- COBOL, INGRES, SQL
- SMARTSTAR, COBOL
- SYSTEMS MANAGER

We offer excellent salaries and benefits. Call or send resume to our Corporate Office TODAY!!!

AMERICAN COMPUTER PROFESSIONALS
P.O. BOX 5125
Columbia, SC 29250
(800) 332-0555
equal opportunity employer m/f

DATA BASE PROGRAMMER

CYBORG SYSTEMS, INC. is an internationally known Chicago based software house with a professionally challenging opportunity for a trained programmer with at least five years in-depth IMS/DL1 experience, COBOL. Knowledge of Payroll/HR applications a plus, especially if with CYBORG products. Experience with many platforms (from mainframes to PC's) also a big plus. This is a high level, visible tech position; with competitive salary, good benefits, and a bright future. CYBORG is a low turnover, stable company in a growth mode. Send resume (must include salary history) to: Cy Reppaport, CYBORG SYSTEMS, INC., 2 North Riverside Plaza, Chicago, IL 60606. equal opportunity employer m/f

CYBORG SYSTEMS

SOUTHWESTERN OPPORTUNITIES

Over 80 career advancing opportunities exist right here and right now, in our 38 company consortium located throughout the great Southwest - Arizona, New Mexico, Nevada, Colorado and California.

We are involved in programming, systems design and software development of hundreds of real-time and on-line systems, fiber optic and digital loop telephone technologies, digital transmission & network services and health care billing systems. Platforms/Architectures:

We utilize IMS DB/DC, Cobol, TSO/SPF, CICS & Assembler, with new PC mainframe development in C, Pascal, Ada and other high level languages and relational databases.

Immediate requirements for 87 professionals, programmers through senior programmer/analysts and architect. FAX resume to (602) 264-6940 or mail resume.

DOUGLAS SYSTEMS INC
3333 N. 16th St. Dept. 0188
Phoenix, AZ 85016

PROGRAMMER/ANALYSTS & SYSTEMS PROGRAMMERS

FOR CAROLINAS AND SOUTHEAST

We have opportunities for on-line and database programmers for both in-house and consulting positions. Fee Paid. Please call or send resume to:

Keith Rolshie, CPC
Systems Search, Inc.
200 Heritage Park
Lake Wylie, S.C. 29710
800/831-2139

(Local to Charlotte, NC)

IBM SYSTEM PROGRAMMERS

We specialize in placing IBM Tech Support Professionals at the best companies in New England, Mid-Atlantic states and the South East.

If you are a career oriented systems programmer, wanting to relo...

Please call John Bell at 301-680-0375, or fax to 301-680-0886, or mail your resume to:

BELL & ASSOCIATES
9515 Deereco Rd., Suite 525
Timonium, Maryland 21093

OPTIMIZATION SYSTEM ENGINEER

Master of E.E. with major in Computer Engineering or Electrical & Computer Engineering. Using knowledge of Artificial Intelligence & Computer Aided Design to design, develop, implement & analysis of linear programming, model validation & optimization software for pipeline industry to perform Very Large Scale Integration Design. Must be knowledgeable in Artificial Intelligence, Computer Aided Design & VLSI Design (1 yr. hands-on experience or 3 hours course work in each area). $31,450/yr., 40-hr wk. Contact Texas Employment Commission, Houston, Texas, or send resume to Texas Employment Commission, TEC Building, Austin, Texas 78778. Job Order No. 5518037. Ad paid by an Equal Employment Opportunity Employer.

PROGRAMMER/ ANALYST POSITIONS SYSTEMS PROGRAMMERS (UP TO $50,000)

With at least 3 years experience in:

- IMS DB/DC, DL1
- CICS
- NATURAL
- ADABASE
- PL1
- COBOL
- DB2/SQL
- ORACLE
- VM/MVS
- RPG/400
- VAX/VMS
- IDMS/ADS/O
- FOCUS
- C LANGUAGE

Please Send Resume in Confidence to:

MSI Management Solutions, Inc.
1416 South Third Street, Louisville, KY 40208

RECRUIT THE BEST!

Place your ad in regional or national editions of Computerworld's Computer Careers section. For more information, call Lisa McGrath at 800-343-6474 (in MA, 508-879-0700).

"We'll be running a regular recruitment advertising schedule in Computerworld to get the results we need."

— Steven Tully
President
Brannon & Tully, Inc.

A custom software development company in Norcross, GA, Brannon & Tully, Inc. provides contract programing/consulting services to a diverse client base of Fortune 500 companies, utilities, and communications companies. President Steven Tully knows that building a staff of experienced professionals is key to the company's ongoing success in developing solutions-based software for specific applications.

"Because our recruitment advertising plays a vital role in finding the seasoned professionals Brannon & Tully needs, we have to expect one thing. Results. That's why Computerworld *is the only trade publication we use for recruitment advertising.*

"Of the over 50 professionals we hired in the past 18 months, over one-third came from Computerworld's *pool of qualified readers. At our present growth rate, we're expecting to double our size in the next 18 months. That means we'll be looking to augment our staff with more and more industry, applications, software, and programming experts to meet the growing demand for greater project diversification.*

"With Computerworld, *we know our ads get read by a very large audience of seasoned IS professionals. Because these professionals are not industry or hardware specific, we get a larger base of qualified professionals to choose from. We also get national reach. In fact, within the last six months alone, we recruited two candidates who moved all the way from California to the Atlanta area.*

"In other words, recruitment advertising in Computerworld *draws bigger numbers.*

Computerworld. We're helping serious employers and qualified information systems, communications, and PC professionals get together in the computer community. Every week. Just ask Steven Tully. For all the facts on how *Computerworld* can put you in touch with qualified personnel, call your local *Computerworld* Recruitment Advertising Representative today.

COMPUTERWORLD

The weekly newspaper of record for computer professionals.

Boston: 375 Cochituate Road, Box 9171, Framingham, MA 01701-9171 (508) 879-0700
New York: Mack Center 1, 365 West Passaic St., Rochelle Park, NJ 07662 (201) 967-1350
Washington D.C.: 8304 Professional Hill Drive, Fairfax, VA 22031 (703) 573-4115
Chicago: 10400 West Higgins Road, Suite 300, Rosemont, IL 60018 (708) 827-4433
Los Angeles: 18008 Sky Park Circle, Suite 145, Irvine, CA 92714 (714) 250-0164
San Francisco: 18008 Sky Park Circle, Suite 145, Irvine, CA 92714 (714) 250-0164

An IDG Communications Newspaper

World-Class Opportunities in New Jersey and throughout the US

For over 20 years, AGS, a NYNEX Company, has played a major role in designing and building computer systems for renowned companies in computer manufacturing, telecommunications, financial services, consumer products and government.

We currently have opportunities in our 36 branch offices nationwide for Data Processing Professionals who are eager to begin a world-class career by joining a group of AGS' top performers.

Immediate openings exist for Computer Professionals with experience in the following:

• DB2, TELON, IMS, CICS

AGS offers outstanding career advancement, competitive salaries and an excellent benefits program including medical and dental coverage, relocation assistance, training, tuition reimbursement, a 401k savings plan and more.

To find out why over 2,000 computer professionals consider AGS a 'world-class' employer, call or send your resume to:

Lovee Tisdale, National Recruiter
AGS Information Services, Inc.
1139 Spruce Drive
Mountainside, NJ 07092

1-800-HIRE AGS
Fax: (201) 654-9794

A NYNEX Company

An Equal Opportunity Employer M/F/H/V

Director of Software Development to supervise the development of microcomputer based software to automate design and manufacture of structural components, trusses and wall panels. Assists analysts in modelling simulation and design configuration using engineering and mathematical principles. Tests, evaluates and refines software and gives technical support to end users. Advises concerning hiring of analysts and marketing of software products to truss and wall panel plants. Must have M.S. in Computer Science or Engineering plus one year experience as Engineering Analyst or in job offered. Must have knowledge of CAD techniques, basic BASIC and C languages Hrs. Mon-Fri 8:30 a.m. - 5:30 p.m. Salary $865.38/wk. Submit resume only to Job Service of Florida, 701 S.W. 27 Avenue Room 15, Miami, FL 33135 Job Order #FL0191508.

SYSTEMS PROGRAMMER

The radio Bible-teaching ministry of Chuck Swindoll needs a systems programmer to install and maintain a wide variety of IBM and third-party software on our IBM 4361 with VSE/SP operating system, CICS, and Computer Associates' DATACOM/DB. Send resume and salary requirements to

INSIGHT FOR LIVING
Suite 100
211 E. Imperial Highway
Fullerton, CA 92635

COMPUTER ASSURANCE SERVICES

Experience the Rewards of Success

At Deloitte Haskins & Sells, Computer Assurance Services is one of our most successful consulting practices. Not only do we support the financial audit function, we provide additional EDP Audit services to a wide variety of audit and non-audit clients. Our success indicates to us that we are the firm to be with if you want a challenging and rewarding career specializing in EDP Audit.

We are actively recruiting staff and senior **EDP Audit Specialists** for opportunities in **Atlanta, Dallas, Houston, New Orleans** and **Charlotte**. Qualified candidates should have an accounting and/or computer science educational background and 2-5 years of demonstrated EDP Audit expertise OR public financial audit experience with a strong interest in computer audit and control. CPA and CISA are preferred, and flexibility for travel is necessary.

The career opportunities we offer are unparalleled in our industry. Others may try to emulate our approach, but we remain the leading edge firm in providing EDP Audit client services. For confidential consideration, please send your resume to:

Regional CM Recruiting Mgr.
Deloitte Haskins & Sells
1700 Equitable Building
100 Peachtree Street
Atlanta, GA 30303.
EOE

Deloitte Haskins + Sells
Consultants to Management

DATA PROCESSING

Join the winning team of Data Processing Professionals.

A nationally based consulting firm has immediate career opportunities for Programmer/Analysts. These positions require two or more years of experience in any of the following skills.

- OS/MVS, UNIX, PICK
- DB2, IMS, IDMS, ORACLE, ADABAS
- ADSO, CICS, IMS DB/DC, TSO/ISPF, TELON, SQL
- "C", COBOL, NATURAL, PASCAL, RPG, SAS, STRATUS, TAL
- M & D FINANCIAL, SYSTEMATICS
- AS/400-SYSTEM 38
- MVS SYSTEM PROGRAMMER

These requirements exist in Omaha, Chicago, Denver, and Iowa.

Applications Design & Development (A.D.D.) has an extremely competitive salary structure and a benefits plan that includes Medical/Dental and Vision. In a service business- our employees are our only product - we care about them.

Send Resume and Job Salary History to either location:

Terri Rowan
Director, Corporate Human Resources
or
Jerry Ladd

APPLICATIONS DESIGN & DEVELOPMENT

CORPORATE OFFICE
11213 Davenport Street, Ste 201
Omaha, Nebraska 68154
(402) 691-6774

1 Northbrook Plaza
5 Revere Dr., Ste 200
Northbrook, Illinois 60062
(708) 205-5200

APPLICATIONS DESIGN & DEVELOPMENT

An Equal Opportunity Employer M/F

PROGRAMMER ANALYST

American Express Company in Salt Lake City, Utah currently has an opening for a Programmer Analyst.

Responsibilities include analysis, design and implementation of major business systems. Bachelor's degree or equivalent required. Must have experience in COBOL and IMS DB/DC.

We offer a comprehensive benefits package and competitive salary commensurate with experience. If you meet the above qualifications, please send resume and salary history to: **Senior Employment Representative, American Express, 4315 South 2700 West, Salt Lake City, Utah 84184-3900.**

American Express Travel Related Services Company, Inc.

Equal Opportunity Employer

RSVP SERVICES

ANALYSTS, PROGRAMMERS, DESIGNERS

If You Have The Right Stuff . . .

2 years minimum professional experience stable work history, good technical references, U.S. citizenship or green card, and competence, in at least one of the following:

- *UNIX/C • VAX/VMS • IBM MVS • AS/400*
- *System/36 • Tandem • Ada • RPG III • DB2*
- *SQL • IDMS-ADS/O • IMS • CICS • ORACLE*
- *INFORMIX • SYBASE • PACBASE • FOCUS*
- *INGRES • ADABAS • SNA • VTAM • BSO • MSA*
- *MAPICS*
- Communications • Networking • Operating Systems
- Compilers • Controls • Parallel Processing
- Distributed Systems • Object Oriented Programming
- Windowing • DB Development OR Administration
- SOA/IVAV OR CSI • ASIX/Sonar • Radar
- Supercomputing • CASE • Expert Systems
- Circuit Simulation • Microprocessors

. . . We Have the Right Service

Thousands of placements of computer professionals since 1966 over 1000 client companies and 200 affiliates nationwide, resume preparation and selective distribution: no cost or obligation to you, no sales pressure.

TO APPLY: Mail or FAX resume or call Howard Levin.

RSVP SERVICES
Dept. C, Suite 614, One Cherry Hill Mall, Cherry Hill, NJ 08002
800-222-0153 or FAX 609-667-2685 (refer to Dept. C)

SYSTEMS ENGINEER P.C. SUPPORT

Entergy Services, Inc., the technical service subsidiary of the Middle South Electric System, currently has an opening for a Systems Engineer with emphasis in PC applications and support.

The position will be responsible for the development and maintenance of marketing and financial systems. The technical environment includes PL/1, SAS, EASYTRIEVE, COBOL, PC-DOS, dBASE III PLUS/FOXBASE/QUICKSILVER/CLIPPER/DBXL, ATTACHMATE and LAN. Job requirements are three to five years experience in development of systems for personal computers. Mainframe experience is preferred but not necessary.

Entergy Services, Inc. offers an exceptional relocation package including a relocation allowance (one month's salary), paid moving expenses, paid house hunting trip, Mortgage Interest Differential, plus Interim Living. For more information, call our toll free number below or send resume to T. Porter, Entergy Services, Inc., P.O. Box 61000, New Orleans, LA, 70161.

1-800-231-4461
In Louisiana call collect (504) 569-4985

Entergy Services
An Entergy Company

An Equal Opportunity Employer M/F/H/V

SEND US YOUR COVERS!

Information Resource Group offers computer directories on a regional basis identifying IBM and DEC mainframe and midrange computer installations along with Key M.I.S. Contacts. Fax or mail us the cover off any of our competitors products and we'll knock $50 off the purchase price of the BaseSite Computer Directory of your choice.

Call for details and a FREE sample page:

1-800-827-8338

Your Key to Data Processing™

WE DELIVER!!

NETWORK SYSTEMS ANALYST

Hillsborough County (Tampa, Florida) is seeking a qualified professional who will be responsible for development of the Criminal Justice Information Systems Network with the County. Requires degree with six years progressively responsible related experience including a network consisting of mainframe computers, minicomputers, and microcomputers. Current local environment is DEC-VAX, UNISYS and NAS. Network supports voice, video and data. Refer to position #NSA1

Submit resume with salary history by November 30, 1989 to:

Department of Human Resources
Staff Development
P.O. Box 1110
Tampa, FL 33601
AA/EOE

MAINE - NH

We have specialized in data processing professional placement in Maine & NH for a quarter of a century. If you qualify for positions in the $25,000-$50,000 range, please contact us in total confidence. Our clients pay our fees and provide relocation assistance.

Dr. ROMAC.

Attn: Dept. 2
P.O. Box 7068978
Portland, ME 04112
(207)773-4748

PROGRAMMERS & DBA'S
ADABAS/ NATURAL/PREDICT

Join the best ADABAS/NATURAL team. Assignments range from programming to performance and tuning. Capacity for telecommuter/remote. Minimum 3 years major with ADABAS & NATURAL. Attractive and well written communications skills and outgoing personality required. Send resume to:

LOGIC UNLIMITED, INC.
1420 Springhill Road,
Suite 150
McLean, VA 22102
Attn: Pat White
(703) 827-5740

Jr. to Sr. level programmers with 1+ yrs. exp. in IBM & other languages (PASCAL, "C", ASSEMBLER, PL-1, etc.) Contract assignments 12 mos. • $20-32/hr. • per diem • to permanent, contact Al Stefano, CEC.

CORPORATE PERSONNEL CONSULTANTS, INC.
[illegible]
Stamford, CT 06901
(203) 359-1000

COMPUTERS

Innovation

COMPUTER SYSTEMS MANAGERS

Lockheed Missiles & Space Company has two positions available for Computer Systems Managers to perform the following.

In the first position, you will operate and maintain a DEC VAX cluster with workstations. Your responsibilities will include software installation, systems tuning and networking. The successful candidate will have a BS degree and 2+ years' experience with VMS operating systems. DCL experience is required.

In the second position, you will operate and maintain a network of Sun workstations in an engineering environment. Your responsibilities will include software installation, systems tuning and networking. You should have a BS degree and 2+ years' experience with UNIX operating systems. A background in "C" language is preferred.

Look to Lockheed Missiles & Space Company for technical challenges and a progressive, exciting work environment. Send your resume to L. Bird, Professional Staffing, Lockheed Missiles & Space Company, Dept 653LTLB, P.O. Box 3504, Sunnyvale, CA 94088-3504. We are proud to be an equal opportunity affirmative action employer. U.S. citizenship is required. **Current EBI preferred.**

Lockheed
Missiles & Space Company
Giving shape to imagination.

LEXIS®

SOFTWARE & COMMUNICATIONS PROFESSIONALS

If you want a job ... apply anywhere!

If you want an opportunity for achievement and the environment in which to pursue it, investigate Mead Data Central, Inc.

Over the past 18 yrs, Mead Data Central has developed the LEXIS® and NEXIS® services into the world's largest online, full-text databases of legal, news, business, and general information. Mead Data Central employs over 2,600 highly-motivated people, working together as a team. We are a wholly-owned subsidiary of the Mead Corporation, a Fortune 150 company.

If you are frustrated or dissatisfied with advancement opportunities in your present position, you owe it to yourself to investigate the following career opportunities at Mead Data Central:

Staff Software Engineers

- Design and implement shared logic interconnection manager and communications software. BS Computer Science, 7+ yrs experience, including strong background in C and UNIX; X-Windows and communication preferred. (031)
- Plan and conduct efforts for complex interactive software systems. BS Computer Science or Systems Analysis, 7+ yrs experience, including interactive system design, high-level languages, and project leadership. (827)
- Design and implement data collection, editing, and fabrication systems for electronic publishing. BS Computer Science, 7+ yrs experience, including C, UNIX, complex scanner/parser technologies, and MRP systems. (994)
- Plan and direct research and development projects to improve and evolve search and retrieval systems. BS Computer Science or Math, 7+ yrs experience, including project leadership on long-term development software projects, and experience with large database storage and retrieval technologies. (925)

Lead Software Engineers

- Lead the design and development of online search, retrieval, and update systems. BS Computer Science, 5+ yrs experience, including IBM mainframes; Pascal, PL/1, Assembler, or C; and MVS or UNIX operating systems. (919)
- Lead the design and implementation of UNIX-based, distributed processing systems. BS Computer Science, 5+ yrs experience, including UNIX internals and networking systems. (CES)
- Develop, manage, and maintain our rapidly-growing CASE environment. BS Computer Science and 5+ yrs experience with CASE workstations, networks, tools, and system administration. (CASE)
- Analyze telecommunication facilities (SNA, Banyan, StarLAN, X.25) capacity and performance; develop analytic models and studies. BS Computer Science or Math, or 5+ yrs experience. Strong analytic skills required. (870)
- Manage online systems configuration for off-hours support. BS Computer Science, 5+ yrs experience in IBM assembler, JCL, and IBM utilities. (915)
- Design, develop, and implement intelligent, network processor software. BS Computer Science, 5+ yrs C experience. (110)

Software Engineers

- Design and develop legal data collection and conversion systems, develop grammars for case law, and annotate case law conversion and validation. BS Computer Science, 2 yrs experience, including UNIX. (993/753)

Lead Systems Programmers

- Maintain and develop our SNA network. AS Computer Science, 4 yrs experience, including VTAM, NCP, NPSI, SNI, and ENA. (830)
- Evaluate, maintain, and analyze problems and resolutions for MVS operating system and related software. BS Computer Science, 3-5 yrs experience in systems programming on MVS operating system software. (922)
- Support VTAM and NCP, including configuration design operations and NTC, and control the SNA network through NCFF or netview-like products. AS Computer Science, 4 yrs experience in general systems programming and network systems. (060)

Project Engineer

- Plan, develop, and direct large development projects for production systems; provide technical engineering focal point for projects within production systems. BS/BA Systems, Computer Science, or Math and 10-15 yrs experience estimating project resources and lead times in large, multi-mainframe systems. (064)

Quality Assurance Software Engineer

- Develop test plans for medium to large projects; lead associate QA engineers during development and execution of test cases; work with development staff to ensure delivery of quality products. BS Computer Science and 3 years experience programming in an IBM mainframe environment. (032)

These are some of the positions now available at our 70-acre campus in Dayton, Ohio—a family-oriented area with one of the lowest costs of living in the country. Mead Data Central offers a competitive compensation and benefits package; paid relocation; a 401k plan; employee incentive bonuses; and a healthy, smoke-free environment.

To schedule an interview, or to obtain more information, send your resume and salary history, in confidence, to the address below. To specify the position for which you are applying, please mention the title and the name or number listed in parentheses after the position description.

Mead Data Central, Inc
PO Box 933; 9443 Springboro Pike
Dayton, Ohio 45401
ATTN: AJ Davis

Mead Data Central is an Equal-Opportunity Employer

NEXIS®

DATA PROCESSING OPPORTUNITIES

Maryland Casualty Company, a leader on the forefront of IBM technology is currently seeking innovative Data Processing professionals who can search for tomorrow's methods and implement them today. The following positions are currently available in our state-of-the-art environment.

DB2 DATA ADMINISTRATOR

This individual will be building a corporate model based on the logical database design of existing data. Responsibilities will include the development of DB2 applications, including analysis, design, coding, testing and implementation of various DB2 tables and related software. The ideal candidate should possess 2-4 years DB2 experience with an emphasis in corporate data modeling. Property casualty experience is preferred. Pacbase or PC experience is a plus!

PACBASE ANALYST

This candidate will be integral in the development of a highly visible online System of Account Management utilizing Pacbase and DB2 applications. Qualifications include 1-2 years Pacbase experience in an IBM MVS environment. 3-4 years CICS is desired. Familiarity with VSAM, DB2 and complex systems testing is a plus!

Maryland Casualty Company offers an exceptional salary and benefits package. Help us make the difference in a competitive industry. Send your resume to: Robin Page, Maryland Casualty Company, 3910 Keswick Road, Baltimore, MD 21211. (301) 338-1503. Fax us your resume for immediate consideration at (301) 338-9222.

MARYLAND CASUALTY COMPANY
A MEMBER OF THE WORLDWIDE ZURICH GROUP
Employment Opportunity Hotline 1-800-4-MCC-JOB
EOE Non-smoking company

SUNBELT & ATLANTA
$25 000 to $95,000
IMS ORACLE DATACOM IMS DB2
VAX MAPICS FOCUS SYS 38 AS 400
TECHWRITERS OP SALES IDMS

PHONE

Southwestern College
SENIOR SYSTEMS ANALYST

Southwestern Community College District invites applications for a Senior Systems Analyst. This position reports to the Director of Computer Systems and Services and is responsible for performing research and rigorous analysis supporting the work of an active, diverse computer services department. Must have excellent skills in computer science, mathematics and statistics and excellent interpersonal skills in dealing with all levels of the user environment. B.S. in Mathematics/Computer Sciences or an equivalent combination of education/experience and three (3) five years using PRIME systems in an educational environment. PRIME INFORMATION and INFO/BASIC experience is essential. Knowledge of COBOL, FORTRAN and RPG desirable. Annual salary $40,188.00, excellent benefits.

Application procedure: Contact Personnel Services Office for detailed job announcement/application procedure. Travel costs must be borne by the applicant. Application deadline: December 11, 1989.

Southwestern Community College District, 900 Otay Lakes Road, Chula Vista, CA 92010. (619) 421-6700 Ext 299 OR 421-0610

An Equal Opportunity Employer

100's U.S.A. JOBS
Computer Programmers
Software Engineers
All Other Computer Specialists
Competitive Pay Fees
Most Often Paid Relocation

HUNTINGTON
Personnel Consultants, Inc.

736 New York Avenue-Ste 209
Huntington, N.Y. 11743-2040
Phone: 516-549-0060
24 Hour Fax: 516-549-7291
JEANETTE A. HENRY, CPC

IT'S CALLED THE GOLDEN GATE FOR GOOD REASON

System professionals can discover career enrichment, personal satisfaction and rewarding employment with our prestigious clients. Sophisticated technologies include Mainframes, Minis, Micros, PC's, Networks, Communications, System Software, Data Bases, 4-GL's, design, development and software engineering.

THE SEARCH FIRM, INC.
595 MARKET STREET, SUITE 1400, SAN FRANCISCO, CA 94105
(415) 777-3900 FAX 777-8632

Computer Professionals: Some people became famous because of their great many abilities.

It's doubtful that any of our NCA consultants will ever become historically famous. Nevertheless, they all possess a great many abilities that are absolutely essential to providing computer career advancement.

They must: be technologically current in rapidly-changing computer developments...be able to maintain close and confidential relationships with hundreds of employers...be able to provide accurately detailed information on hundreds of computer career opportunities, locally and nationally...be able to merit the confidence of all candidates...be able to represent them professionally and to negotiate diplomatically. With these abilities, and more, they can assure you that: "All little strokes fell great oaks."

Come in. Call. Or mail your resume to the NCA firm nearest to you. No charge to you ever. Confidentiality is assured. Act today! Because as the man said: "Time is money."

National Computer Associates

Sr Consultant, Utilities	To 50K
Sr Consultant, Banking	To 45K
Sr Consultant, Textiles	To 45K
Data Base DB2	To 45K
Data Base, IDMS	To 45K
Telecommunications, NCP	To 45K
Capacity Planning	To 45K
Project Leader MSA	To 45K
VM Sys Prog IBM PC	To 42K
CICS Sys. Prog., IBM PC	To 42K
P/A, Ingres	To 40K
S/A s, CICS (need 10)	To 40K
P/A s, CICS (need 10)	To 35K
P/A s, Life 70	To 35K
P/A s, AS/400	To 35K
P/A's, System 38	To 35K
P/A s, Hogan DDA	To 33K
P/A s, IDMS	To 33K
P/A s, IMS	To 33K
P/A s, IDMS	To 33K

EXCLUSIVE POSITIONS

Contract & Permanent

DMS CICS IMS VAX-RDB

Sr. Prog. Analyst
Sr. Sys. Analyst
• Project Managers
• Systems Programmers
• Data Base Analysts
Technical Editors

Chuck Klein & Assoc.
3940 Thorson Dr.
Placerville, CA 95667
(916) 644-5396

First Interstate Bank

INVEST YOUR FUTURE IN OUR GROWTH.

- **Marshal & Ilsley**
- **Computer Associates**
- **Hogan**

First Interstate Bancorp is one of the ten largest banking organizations in the country today. With over $50 billion in assets, our commitment to continued growth and financial strength are unsurpassed in the industry. And, that means incredible opportunities for you to invest in your future at First Interstate Bank of Texas. Explore your potential in one of the following Applications and Systems Development positions.

We are looking for a variety of professionals including: Programmers, Programmer/Analysts, Systems/Analysts, Systems Specialists with experience in any of the following:

- COBOL
- ASSEMBLER
- IMS DB/DC
- DB2
- DISC/IRS
- Computer Associates
- Marshal & Ilsley
- Hogan
- Shaw Consumer Loans

For immediate consideration, please send your resume, in confidence, to: **Gary Wilson, First Interstate Bank of Texas, N.A., P.O. Box 3326, MS 216, Houston, Texas 77253-3326. We are an equal opportunity employer, m/f/v/h.**

AS/400

Programmer/Analyst with 2-3 years experience on S/36 or AS/400 needed for Fortune 100 company. Manufacturing background and strong RPG III/CLP skills required. James River is a world leader in the manufacturing of paper and packaging products employing over 39,000 worldwide.

Send resume and salary requirements to

James River Corp.
210 Kansas City Ave.
Shreveport, LA 71107
Attn: MIS Manager
EOE

SR. ACP/TPF SOFTWARE DESIGN ENGINEER required. Design and develop new ACP/TPF applications for the Real Time Freight System. Design of system functionality, coding, testing and implementation. Assist programmers and other analysts in program applications design, test and implementation of new software. Ensures that software and system standards are maintained according to the principles of an ACP/TPF environment. Design interfaces with other aspects of transportation industry. Provide system maintenance and maintain system integrity. Applicants required to have Bachelors degree in Computers, Math or Engineering with at least two years ACP/TPF Programming and Basic Assembler Coding experience. Education and experience will be found acceptable if applicant has a combination of professional development courses, training and experience equivalent to a bachelors degree in Computers plus two years ACP/TPF Programming and Assembler Coding experience. Annual salary will be $39,000 for 40 hours a 40 hour week. Additional salary may be paid up to $44,000 if education and experience warrant. Interested applicants apply at the Texas Employment Commission, Dallas, TX, or send resume to the Texas Employment Commission, Austin, TX 78778-0001. J.O. number 57571?8. Paid by an Equal Opportunity Employer

---

CA & AZ CONTRACTS

CONSULTANTS WANTED

P Murphy & Associates, Inc

4405 RIVERSIDE DRIVE, SUITE 100
BURBANK, CA 91505
(818) 841-2002 (714) 552-0506
FAX: (818) 841-2122

CONSULTANTS

AS/400, DB2, IMS DB/DC, CICS, IEF, TRANSFORM, CSP

Over 40 consulting and permanent positions available nationwide to experienced professionals. We provide additional training to our consultants. Please forward your resume in confidence

TRAINING

AS/400, DB2, CMF, IMS DB/DC, CICS, CSP, SOFTWARE ENGINEERING

RTPI provides hands-on training in the above named products using IBM 3090 and AS/400. Call for winter schedule

Relational Technology Professionals Inc.
5125 N. 16th St. A-112
Phoenix, AZ 85016
(602) 230-7322

MIS DIRECTORS

If you need good people, we've got them. Computerworld reaches more than 812,000 computer pros every week. That's more qualified computer pros than any newspaper can deliver. And you can select either a regional edition or national edition of Computerworld's Computer Careers section for your ad.

For more information, or to place your ad regionally or nationally, call Lisa McGrath at 800-343-6474 (in MA, 508-879-0700)

Weekly, Regional, National.

Senior EDP Auditor to 45,000

Industry leader seeks polished EDP audit professional with excellent oral and written communication skills. Qualified individual must be familiar with the system development life cycle, exposure to application or system audits and a strong desire to succeed. CISA certification would be helpful.

EMERGENT MIRUP DATA PROCESSING
7733 Forsyth Blvd.
St. Louis, MO 63105
(314) 727-1535
FAX: (314) 727-1321

We Speak Your Language.

FLORIDA

The Perfect Climate For Professional Growth

We are Romac & Associates, specialists in the data processing industry. Currently our technically sophisticated clients have requirements for the following:

- PROGRAMMER ANALYSTS
- SYSTEMS ANALYSTS
- SYSTEMS PROGRAMMERS
- DATA BASE ANALYSTS
- SOFTWARE ENGINEERS

WHO HAVE EXPERIENCE IN ANY OF THE FOLLOWING AREAS:

- IBM/MVS
- CICS
- COBOL
- ASSEMBLER
- TANDEM/TAL
- MVS
- IDMS
- DB2
- MODEL 204
- C
- SYSTEM 38
- AS-400
- RPG III
- FOCUS
- INGRES

Our clients offer top salaries and a perfect climate. Please send resume or call any of our Florida locations.

- TAMPA — 1 Harbour Place, Suite 1000, Tampa, FL 33602, (813) 229-9575
- FT. LAUDERDALE — 5900 N. Andrews Ave, Suite 500, Ft. Lauderdale, FL 33309, (305) 928-0881
- ORLANDO — 01 N. Orange Ave, Suite 1500, Orlando, FL 32801, (407) 843-0765
- JACKSONVILLE — 6 Laura Bay St, Suite 1400, Jacksonville, FL 32202, (904) 358-4888

ROMAC.

Professional Recruiters
All fees are approved by our client companies.

UNISYS PROGRAMMERS

- Travelling P/As to $40K
- 2 yrs 1100 COBOL or MAPPER
- COBOL P/As ... to $40K
- 2-10 yrs DMS 1100 or DMS II
- LINC P/As ..... to $40K
- 1-5 yrs LINC programming
- EXEC Support to $50K
- 2-10 yrs MASM, dump anys
- MAPPER P/As to $42K
- 2-5 yrs run design or coord

Permanent placement for UNISYS Programmers throughout the U.S.

COMPUTER STAFFING

Call 800 86UNISYS

Immediate Contracts and full time Positions Available:

Call or Fax Resume to

DataLink Corporation
153 Waverly Place
Suite 3 - Seventh Floor
New York, N.Y. 10014

212-243-5488
Fax # 213-989-6457

"The Missing Link to D.P. Recruiting"

---

attention

★ NEW SYSTEMS SOFTWARE CO★
MVS INTERNALS EXPERTS
$40K-$100K +STOCK+/ 10
★GTE SOFTWARE DEVELOPERS★
★SYSTEMS PROGRAMMERS★
★ SYSTEMS ENGINEERS★
★SOFTWARE SALES★

Nine Sr. Cal. S/W vendor is currently seeking several Developers and Support Specialists with 3+yrs. Re-Entrant BAL and MVS, DB2, VTAM, CICS or UNIX Internals. Become part of a team to make technological advances in:

COMM • NETWORKING • OPERATING SYSTEMS • AUTOMATED OPERATIONS

Call WAYNE CARTER today
213/276-4888 • 800/323-1880 • FAX 213/656-1569
9100 WILSHIRE BLVD. #442 BEVERLY HILLS CA. 90212

PRODUCT MARKETING ENGINEER

Compare target specifications with competitive products for synergy with 80x86 processor, prepare technical block diagrams, document technical issues of published products, generate presentation materials, research possibility of positioning products into Flash Distributed Data Interface (FDDI) efforts, evaluate competitor's performance by generating benchmarks, convert existing benchmarks into C programming language to meet 80x86 processor requirements, prepare pricing recommendations according to our benchmark performance. Technical undergraduate degree in Engineering or Computer Science and university training or research or experience with microprocessor architecture including 80x86, assembler level programming and C language. MBA Marketing and technical undergraduate degree in Engineering or computer Science. $2,500 per month. Job & Interview Site: Chandler, Arizona. Send resume with copy of this ad to: Dept. 2288-AC, 4748 N. 7th Street, Suite 220, Phoenix, AZ 85014. EOE

PROGRAMMER/ ANALYST

PRIME INFO/BASIC

Experienced PRIME programmer required - background in local government a plus. Salary range for this position is $24,000 to $33,775 per year (depending upon experience). We are a county government located in a university town in Southern New Mexico - the Land of Enchantment. Qualified applicants send resume to Personnel Director, Dona Ana County, 180 West Amador Avenue, Las Cruces, NM 88001

MIS PROFESSIONALS

Our sunbelt clients are currently seeking candidates with experience in IMS, IDMS, ADS/O, CICS, ADR/DATACOM, DB2, or VAX RdB, INGRES, or ORACLE, for positions as Prog/Anal, Sys/Anal, DBA s, and Project Managers. Salaries range from $25K to $75K DOE. Contact

JIM BOETIC
PHILLIPS RESOURCE GROUP
P O Box 5664
Greenville, SC 29606

803/271-6960 (Days)
803/292-1181 (Evenings)
803/271-6468 (FAX)

You can recruit the right people in the right places with right price!

It's the IDG Communications Computer Careers Network, and it lets you run the most targeted and cost-efficient recruitment program possible.

Its many options help you recruit qualified computer and communications professionals - regionally or nationally - with combination buys of up to five leading newspapers. And all together, the Computer Careers Network delivers your message to an audience of well over 1 million qualified computer professionals.

Look at what the Computer Careers Network lets you do: Customize your recruitment program. The Network's five newspapers - *Computerworld, InfoWorld, Network World, Digital News, and Federal Computer Week*, - let you tailor your recruitment program to your specific needs. You can buy as many as five newspapers with add-on options. That way you can recruit from the combination of computer and communications professionals that's best for you.

Target your ad placement. You can place your advertising exactly where you want. If you wish to recruit within a specific area, you can advertise in the regional editions of the newspapers you choose - East, West, or Midwest. Or you can extend your reach by running in two regions - or even nationally. Plus - you can still take advantage of standalone national rates for individual newspapers.

Reach qualified professionals cost efficiently. Gone are the days when you have to worry about paying for waste circulation. The Computer Careers Network lets you buy the combination of newspapers that will deliver your recruitment message to qualified computer and communications professionals - and only those qualified professionals you need to reach.

Weekly. National. Regional. It Works.

World-class challenge at Global Dynamics.

At Global Dynamics, we give new meaning to the term "world class." Our contract programming and systems consulting services are utilized by major corporations around the globe. Which means that you'll have the opportunity to work with the industry's latest advancements while enjoying a wide range of local assignments. Consider Global Dynamics. You'll discover a whole new world.

We have current opportunities in the following areas:

- IBM SYS 38, AS/400, RPG III
- Macintosh Consultants
- IDMS ADS/O, DBA's
- Model 204 Consultants
- DB2 Consultants
- OS2 Consultants
- TPF all levels in the U.S., Europe, and Australia
- COBOL, CICS, VSAM
- VM Systems—Internals
- STRATUS—System 88
- Communications, VTAM, SNA
- Tandem Consultants

Interested candidates please call Susan Katz or Brian Cott at 1-800-346-5948 or 1-415-946-0601. Or send your resume to: GLOBAL DYNAMICS, INC., 2890 North Main Street, Walnut Creek, CA 94596. Fax #: 1-415-946-9247. EOE.

GLOBAL DYNAMICS INC.

Creativity Creativity Creativity

The Essence of a Codex Engineer

Codex, a division of Motorola, is a leading worldwide supplier of data communications equipment for private networks, from transmission products through wide area networking solutions (STDM, X.25, TI), all under integrated network management. Codex is a recognized leader in bringing state-of-the-art technology to products such as the first commercially successful 9.6 kb/s modem ('71), first statistical multiplexer ('76), ISDN terminal adapter in first U.S. ISDN trial ('87), and the first OSI based network management system ('87).

We are building upon our expertise to provide advanced private networking solutions for the 1990's: areas of activity include systems architecture and design of integrated switching nodes, software architecture and the design of real-time distributed multiprocessor networking products, ISDN call processing and frame relaying, LAN interconnection, network architecture and algorithms, voice coding and packetization, use of formal description techniques for protocol development.

Research & Advanced Development

Research and Advanced Development at Codex brings together research, advanced marketing and advanced development in a unique setting to focus innovative efforts in new communication technologies. The ideal Codex R&AD engineer is one who wants to see his/her ideas realized in commercial products: someone with outstanding technical ability and the desire to turn ideas into tangible output that meets real market needs. If you are qualified by education and have experience in one or more of the following areas, we invite your inquiry.

- Real-Time Distributed Operating System Design and Implementation
- Communication Protocol Software Design and Implementation
- Development of Resource, Configuration and Fault Management Software for Networking Nodes
- Call Processing Software Design and Implementation
- Software Integration, Testing, and Performance Measurement
- State Machine Firmware Design For Communication Framing Formats
- Network Architecture and Internetworking Specification
- Voice Coding Algorithm and DSP Software Design

Software Engineers should be fluent in "C". Working knowledge of structured design techniques and object-oriented development methodologies is desirable.

Network Management

Codex is experiencing significant growth in its Network Management Development groups. We are hiring Software Development Engineers at all levels who can contribute to our state-of-the-art development efforts for the next generation of Network Management products. Contact us today if you are a degreed Software Engineer with at least 2 years' experience in one or more of the following:

- Network Management Concepts and Applications
- Software Development in "C" or Object-Oriented Language
- Graphical Human Interface Techniques
- Network Topology Management
- Aegis or UNIX™ Operating Systems
- Development of IBM/PC Applications Software Under MS Windows
- Database Definition and/or Database Tool Development
- Development and Maintenance of Standard Protocol Software
- Development of LAPB, X.25, ISO Network Layer, ISO Transport Layer
- Design, Implementation and Test of Reusable Device Management Software
- Structured Software Development
- Development of IBM Mainframe-Based Applications
- IBM Netview
- Development of Network Management Applications for VAX/VMS
- Use of Object-Oriented Techniques for Software Development
- Use of Apollo Workstations

Codex offers an excellent environment conducive to professional growth, competitive salaries and a comprehensive benefits package including profit sharing, 401K and a generous pension plan. Our Advanced Sourcing concept allows you to add your resume to our database now and be reviewed against current and future openings based on your goals and requirements. Qualified candidates, please call 1-800-542-0566 or send a resume to the Advanced Sourcing Group at Codex Corporation, Dept. WC 1113, 20 Cabot Blvd., MS M4-70, Mansfield, MA 02048. An Equal Opportunity/Affirmative Action Employer, M/F/V/H.

codex

MOTOROLA

UNIX is a registered trademark of AT&T Bell Laboratories

If you have a PC and a modem, find out more about Codex and other opportunities we have available. Just dial (508) 263-3697, hit return twice, and enter CODEX when prompted for a password.

Executive Director

Ohio Library and Information System (OLIS)

The State of Ohio Seeks an Executive Director for its new Ohio Library and Information System (OLIS). This state-of-the-art system will enable Ohio's major university libraries to appear to users as a single resource comprising more than 17 million volumes. OLIS will also provide unparalleled access to the rapidly increasing array of information sources available in electronic formats. Faculty and students from participating universities will have direct access to and quick delivery of materials held by the state's principal academic libraries.

Qualifications:

- 6-8 years progressively responsible administrative experience;
- familiarity with the issues of implementation and maintenance of a large sophisticated information system serving end users;
- ability to direct a staff of library and computer professionals;
- ability to negotiate complex technical contracts with vendors;
- acknowledged leadership role in the field of end-user information systems;
- sophisticated oral and written communication skills must be demonstrated, including the ability to interpret technological advancements and to articulate the OLIS vision to the user community.

Desirable:

- ALA accredited Master's Degree in Library Science;
- grant proposal writing and administration experience.

Salary:

- Salary competitive based on qualifications and experience.

Position available July 1990.

To ensure full consideration, applications should be received by January 31, 1990.

Preliminary interviews may be scheduled at the American Libraries Association Mid-Winter meeting, January 1990, Chicago.

Applications, nominations and inquiries should be directed to:

E. Garrison Walters
Associate Vice Chancellor
for Graduate & Special Programs
Ohio Board of Regents
3600 State Office Tower
30 East Broad Street
Columbus, OH 43266-0417

Systems Programmer

Systems Center, Inc., a technical leader in the systems software industry, has an immediate need for a Systems Programmer.

This position is responsible for the installation and maintenance of all system, utility, database, communication, and application support software. Qualified applicants will have a B.S. in Computer Science or Business, or equivalent work experience; a minimum of two years VM systems programming; familiarity with CP and CMS internals; 370 and REXX; the ability to provide support for and problem resolution in a diverse data communication environment, good oral and written communication skills; and the willingness to work in a service-oriented environment.

Systems Center offers an exceptional benefits package (with all employees receiving stock options), competitive salaries, and a challenging work environment. Qualified applicants should send resumes, including salary history, to: Systems Center, Inc., Dept. DC-RH-N9, 1800 Alexander Bell Drive, Reston, VA 22091. Principals only.

SYSTEMS CENTER

An Equal Opportunity Employer M/F/H/V

FLORIDA

Your Chance To

- Expand Technical Skills
- Accelerate Career Path
- Improve Lifestyle

PA LAWSYS COBOL IPS	33K
PA HP3000 / SPECIMAN	45K
PA 4680 POS	36K
PA DB2 SQL	42K
PA SYS 36 AS400 RPG	42K
PA IDMS ADSO	45K
PA Telephone Billing	36K
PA CMS	38K
PA CICS PERSONNEL	45K
PA IMS DB/DC	42K
PA VAX COBOL ORACLE	37K
SE ADA VMS	42K
Sys Prog Tandem	48K
PA INFORMIX C	40K

Many Other Permanent and Contract Positions Local and Nationwide

COMPUTERPEOPLE

12230 28th St., North
St. Petersburg, FL 33716
813-572-9338

3005 W. Cypress Creek Rd.
Suite 3
Ft. Lauderdale, FL 33309
800-777-8602 or
305-771-8602

20 North Orange Ave.
Suite 1402
Orlando, FL 32801
800-648-1064

New Challenges New Opportunities

Immediate need for per diem consultants and permanent employees to work on state-of-the-art developments for Fortune 500 clients in Washington DC, North Carolina, New York, New Jersey, Texas and Georgia.

DB2
ADABAS/NATURAL
UNIX

Other positions also available. Excellent daily rates or salaries plus benefits. No Entry Level.

Call/Write/Fax: Recruiters

Structured Logic Systems, Inc.

Two Penn Plaza, Suite 1540, New York, NY 10121
Phone 212-947-7510; 1-800-537-1132
Fax: 212-947-9339

* DP PROS *

We are continually looking for the following skills on a national and international basis. Contractors welcome.

TANDEM/COBOL/SNAX
S-36/400 RPG/COBOL
IDMS/DB-2/ADABASE
CICS/COBOL/BAL/IMS
PC/LAN EXPERTS
UNIX/C/X.25/TCP/IP/SNA
S/W OR H/W ENGINEERS
HP/VAX/COBOL
SYST PROG/MVS/UNIX/VMS

Please call, fax, or mail resume to:

Electronic Search - DP Div.
9300 N. River Road - Suite 7040
Rosemont, IL 60018
Phone: (312) 318-9000
Fax: (312) 318-9004

* GET OUT * OF TOWN

NATIONWIDE OPPORTUNITIES

YOUR HOME TOWN MAY HAVE MANY JOBS, BUT WE THINK CAREER ADVANCEMENT THE COMPUTER-VISE NETWORK OF 19 NATIONAL COMPUTER SEARCH AGENCIES SPECIALIZED IN THE PLACEMENT AND PAID RELOCATION OF COMPUTER PERSONNEL TO ALL AREAS OF THE U.S.A.

(310) 364-0900
FAX#(310) 364-0901
TOLL-FREE 1-800-759-3674

COMPUTER | INTERFACE

MARKETPLACE

Window shopping with a PC

To get information, let your modem meander through an on-line service

BY JESSICA KEYES
SPECIAL TO CW

You are searching for the perfect printer. You hike over to the local computer store and learn about five, maybe six, different models. Back at the office, you leaf through a stack of computer magazines and see page after page of glossy advertisements. Decisions, decisions. How can you make an intelligent choice when you are faced with this welter of information?

Does this situation sound familiar? Isn't this the reason information systems people ply their trade? Our mission is to present information so that people can use it to make intelligent and informed decisions. We seem to be dealing with a case of the cobbler's children wearing no shoes.

Fortunately, our personal computers can deliver the shoes. With little more than a modem and an access code, we can survey just what is available in hardware and software from the comfort of our chairs.

From farming to Freud

On-line information services such as Dialog Information Services, Inc. in Palo Alto, Calif., and Compuserve, Inc. in Columbus, Ohio, can help us keep up with the frantic pace of technological change and the surge of product announcements.

Dialog touts itself as being the world's largest "knowledge bank," with information on subjects ranging from agriculture to psychology. Its Computers and Electronics Knowledgebase is a collection of six databases containing reviews, articles and announcements on mainframes, midrange units and PCs as well as business software.

Search-string service

The costs of accessing these databases vary but typically amount to about $1.75 per minute; a typical search takes 10 or 15 minutes. With such pay-for-use charges, it is best to format your search string before you access the service. A $149 software package from Dialog permits you to format and edit your inquiries rather than incur the cost of making mistakes on-line.

Let's say that during a lull in office activity, you decide to look for reviews or descriptions of computer games. You enter "Begin Comp" to access the microcomputer index. Dialog responds with a confirmation that you are indeed in the right database. At the prompt, you enter your search string: "Find Game? and Review$ and Apple II$."

The system responds with "S153 Game? and Review? and Apple II," meaning there is a set of 153 references that match your criteria. You can now list these references or narrow or widen the search by asking another question such as "Find S1 and JN = Computerworld," commands that would look for reviews in only that publication.

Another well-known pay-for-use service is Compuserve. Its Computer Database Plus provides access to tens of thousands of articles from hundreds of publications. The search capabilities are less sophisticated than those of Dialog, but this service is much easier to use, costs $12.80 per hour for connect time plus a fixed $1.50 per month and provides more full-text articles.

Recently, a friend asked me to locate some information on add-on boards for the IBM PCjr. Since PCjr. has not been sold in years, it is nearly impossible to find any add-ons at local PC dealers. Compuserve was my way out. I entered the search string "IBM PCjr" and Computer Database Plus found six entries. By displaying the menu of matching articles, I was able to get the information I needed.

If Computer Database Plus does not solve your problem, Compuserve's IQuest service may do so. IQuest is a research and reference service complete with on-line Help (aptly accessed by an SOS command). IQuest has many different databases covering computers and business.

> WITH LITTLE more than a modem and an access code, we can survey just what is available in hardware and software from the comfort of our chairs.

Computer searching greatly lessens the amount of time you spend looking for a given amount of information: At the touch of a key, you can search out information about hardware and software tools. But you can also use these services to search for information relating to a concept.

For example, suppose you want to get your company involved in computer-aided software engineering (CASE). Your management, however, is not convinced of the merits of CASE. Searching the on-line databases, you specify the tool you would like to purchase. You then search for articles that discuss other companies that have tried CASE and the merits of CASE tools. Armed with them, you make your case for CASE. Your firm's management is impressed with the information that you have compiled and grants your request. Case closed.

The computer marketplace is huge, and there is no way for buyers to keep abreast of its constant change. Delivering systems that are innovative but also reliable and cost-effective requires research, and research requires the proper tools. Why not practice what we preach and automate the process?

Keyes is president of New Art, Inc., a management and computer consulting firm in New York, and formerly managing director of technology at the New York Stock Exchange.

Index

Marketplace 124
Buy/Sell/Lease 124
Software 127
Peripherals/Supplies 130
Graphics/DeskTop Pub 128
Bid Proposals/Real Estate 130
Business Opportunities 130
Time/Services 127
Training 129

Buy/Sell/Lease

IBM 3X and AS/400 equipment at IPL prices

Most people know IPL Systems as a provider of cost effective alternatives to IBM in storage products. What they may not know is that IPL Systems offers IBM products at the best prices in the industry.

In fact, if you send IPL a written quote on any IBM product in stock, IPL will beat the quote as well as ship within 24 hours under Net terms. All IBM products sold are guaranteed to be covered under your IBM or third party service agreement.

We even welcome you to try any product for up to 7 business days with no obligation to purchase. Don't pay more than you have to!

IBM ® Memory (3X, AS/400) ® Tape (3X, AS/400) ® DASD (3X, AS/400)

Call 1-800-338-4ipl (in MA, 617-890-6620)

ipl

WE BOUGHT IBM

By the thousands.

And we still do. Computer Marketplace has bought thousands of IBM AS/400, Series 1, S 3X, 43XX, 30XX, tapes, drives, printers and other peripherals and we are very interested in offering you top dollar for yours.

We also deal in data communication equipment such as multiplexors, modems and protocol converters.

Or if you have a need to buy, call us first and BUY DIRECT from the

COMPUTER MARKETPLACE 800-858-1144

In California, dial (714) 735-2102
205 East 5th Street, Corona, CA 91719

IBM IS A REGISTERED TRADEMARK OF INTERNATIONAL BUSINESS MACHINES INC

D E C
Peripherals Systems Upgrades
DG • APOLLO • SUN
International Computer Exchange, Ltd.
1-800-ICE-BUYS
FAX: 617-890-6177

● Data General ● Fujitsu
● Data Products ● CDC
● Printronix ● Zetaco
BUY SELL TRADE
(617) 982-9884
FAX: (617) 871-4486

Buy IBM Sell
36 38 43 DISPLAYWRITERS
RK RESOURCES UNLTD INC

PRINTERS
IBM 3262 - 003
IBM 3268 - 002
IBM 3287 - 002; CO2
SALE OR LEASE
Bluebonnet Computer Co.
Austin, TX
(512) 926-3900
Member CDLA

Buy/Sell/Lease

EXSEL DIRECT
EXCLUSIVE... GENUINE IBM Personal System/2 Model 50 Computers
50% SAVINGS!
At the "Right" Price Point!
THE EXSEL OPPORTUNITY
Exsel Inc. is offering the popular IBM PS/2 Model 50 fully remanufactured at a fraction of its original price! All systems are factory tested and repackaged to a LIKE NEW condition and include a 90 day warranty. It's the genuine IBM PS/2 product that you have seen advertised on television, the radio, newspapers and referred to as "The next generation in personal computing."
THE PS/2 MODEL 50 FEATURES INCLUDE:
BRAND NEW AMBER MODEL 452 VGA MONOCHROME MONITOR
$3840.00
EXSEL LOW PRICE
$1888.00
1-(800)-524-3001
In NY 716-873-6770
EXSEL

IBM BUY · SELL · LEASE
SYSTEM 36/38
AS/400
43XX 30XX
SERIES 1
AT&T VOICE SYSTEMS
• Processors
• Peripherals
• Upgrades
JE DIESEL
(800) 888-2000

Reconditioned digital™ IBM Equipment
Whatever your requirements are for Digital Equipment, call CSI first! Buying, selling, trading, leasing, consignments - we do it all!
CSI sets all equipment with a 30 day unconditional guarantee on parts and labor and is eligible for DEC or IBM maintenance.
Offering systems, disk drives, tape drives, printers, terminals, memory, options, boards, upgrades and many more.
CSI Computer Systems, Inc.
75 Tosca Dr. Stoughton, MA 02072
CALL TOLL-FREE 1-800-426-5468
In Mass. (617) 344-0600
FAX (617) 344-4100

• BUY NCR • SELL
• SYSTEMS
• COMPONENTS
"SINCE 1976"
HARWOOD INTERNATIONAL CORPORATION
• PERIPHERALS
• NEW EQUIPMENT
HARWOOD INTERNATIONAL CORPORATION
100 Northshore Office Park
Chattanooga, TN 37343
615-870-8000
TELEX:3780001 FAX:615-875-5100

IBM Unit Record Equipment
Data Modules/Disk Packs
Magnetic Tape/Diskettes
029-082-083-084-085-086
129-514-519-548-557-188
2316-3336(1)&(11)-3348(70)
80-200-300 MB
Disk Packs

We buy, sell, lease & rent quality new and used equipment. And we stand behind it for a year.
VT 100 ..... $00.
VT 101 ..... $100.
VT 131 ..... $125.
VT 340-DA ..... $2,195.
VR 201 ..... $000.
Esprit 10/25 ..... $100.
Limited Supply
RA60-AA ..... $9,000.
CALL NOW
RD50 ..... $140.
RL02 ..... $140.
RK07 ..... $140.
RD52 ..... $400.
RD53 unused ..... $700.
DSRVB-AA ..... $1,000.
TA81-AA ..... $11,000.
HSC50-BA ..... $6,000.
HSC50-CA ..... $6,000.
Data Probe
S-300 ..... $000.
LA100-2A ..... $000.
LA120-DA ..... $400.
LP26-DA ..... $000.
LQP02 ..... $000.
Fuji SP830 ..... $100.
Printronix P300
w/ graphics ..... $1,000.
11/750 w/FP ..... $1,000.
CI 750 ..... $1,000.
11/780 w/FP ..... $2,000.
CI 780 ..... $2,000.
TRIDEX CORPORATION
CALL 800-677-3636
Phone: 603-886-0383
Fax: 603-886-0914
375A WEST HOLLIS ST. NASHUA, NH 03061
sun microsystems IBM digital™

4381
R 14
32 Megabytes
12 Channel
channel to channel adaptor
No brokers please
For more information Contact, Mr. Jones
(503) 641-6453
Ext. 5405

IF YOU'RE BUYING, WE'RE SELLING
IF YOU'RE SELLING, WE'RE BUYING
IBM SYSTEMS
Buy • Sell • Lease PERIPHERALS
(800) 331-6283
TOLL FREE
(213) 394-1561
CALIFORNIA
Ocean Computers, Inc.
510 Santa Monica Blvd., Ste. 200
Santa Monica, CA 90401

Buy RT AS/400 SERIES/1 S/36,38 937X 4300 Sell
Lease Rent
All IBM Machines and Parts
612-942-9830
DATATREND

HONEYWELL
LEVEL 6 DPS 6 SERIES 16
• Complete Minicomputer New & Used
• All Peripherals and Terminals
• Upgrades and Features
• Depot Repair Capability
• Honeywell Maintenance Guaranteed
• Immediate Delivery Low Prices
• HDS 5 & GHS Compatible Terminals
The Recognized Leader
Honeywell Minicomputer Sales and Support
BCS
BEAL COMPUTER SERVICE
Northboro, MA

WE WILL BUY
IBM SYSTEM PERIPHERALS
2914, 3081, 3082, 3083, 3272, 3274, 3276, 3277, 3278, 3287, 3410, 3411, 3420, 3803, 3804, 3705, 3725, 3726, 3800, 3803
& most Personal Computer Systems
IN WHOLE OR PARTS.
Please Call Purchasing
Computer Service Supply Corp.
1-800-356-7815
In N.H. (603)437-4004
The Computer Parts Vaults

LSI• PDP• VAX•
SYSTEMS & PERIPHERALS
DCE DIGITAL COMPUTER EXCHANGE INC
CALL (415) 867-3100

NORTHEAST MINICOMPUTER, INC
55 High Street, Unit 6
Billerica, MA 01862
Wants to Buy Your Surplus DEC Computer Equipment
We Pay Cash for Your Unwanted Computer, Peripherals, Options, Memory, and Terminals.
Call 1-800-343-8302 or in Mass. 1-508-663-2560.
Or Fax Your List 1-508-667-0716
Turn Your excess inventory into Cash $$$$
dda

LEASE XYONIX INC., one of the largest distributors of new, used, and refurbished DEC, IBM, SUN, & AT&T computer equipment, stresses
Customer satisfaction
Service with a personal touch
Warranty i.e. We stand behind our products
Prompt delivery
Competitive pricing
Extensive inventory
CALL TODAY!!
XYONIX INC.
(603) 893-4200
OR FAX TO:
(603) 893-4899

DEC VAX & AT&T
BUY-SELL-NEW-USED
Systems, Peripherals, Options available for sale
Looking to purchase VAX and AT&T Systems, Hardware
LAKEWOOD COMPUTER CORP.
Ft. Collins, CO
dda

Buy/Sell/Lease

LEAS PAK International 1-800-532-7725

2120 LeasPak Parkway • Bedford, TX 76021 • D/FW Metro 817-267-2041 • 1-800-532-7725
6263 N. Hayden Rd., Ste. 270 • Scottsdale, AZ 85250 • 602-951-4511 • 1-800-678-9409
9809 Reeds Rd., Ste. 280 • Shawnee Mission, KS 66202 • 913-432-1941

SYSTEM/36	AS/400™ All Models! Call for Quote				SYSTEM/38
• B to D Upgrades	5363 • AS/ENTRY All Models/Features				• Model Upgrades
• 1 mb/2 mb Memory	PRINTERS		DISPLAYS		• Communications
• 358 mb DASD	4224	5224	3476	3196	3180	• DASD
• 200 mb DASD	4234	5225	3477	3197	5291	• All Features
• Communications	6262			5251	
• All Models/ Features	DASD		CONTROLLERS		
	9332	9335	5394		5294

U.P.S. for S/36 • S/38 • AS400 350 VA to 15 KVA Call for Info

NOW BUYING AS/400's • S/36's • S/38's • PERIPHERALS
$$$ WE PAY CASH $$$
(All equipment subject to prior sale or lease.)

BL Associates Inc.

BUY SELL TRADE

DATA GENERAL

- STC
- Data Products
- Printronix
- Control Data
- Cipher
- Fujitsu
- CDC
- Zetaco
- Dataram
- Wyse

BL OFFERS:

- Full Brokerage
- Software Support
- Hardware Consulting
- Warranties

145 WEBSTER ST., SUITE A HANOVER MA 02339
617-982-9664
FAX: 617-871-4456

GTEX FINANCIAL GROUP Inc

IBM

BUY SELL LEASE

PS/2 OPERATING LEASES

3084 3090 PERIPHERALS

OEM/PCM LEASES

800-888-7568
FAX 214/783-1379

Member CDLA EST. 1978

HEWLETT · PACKARD

1000 • 3000 9000

Computers • Peripherals
Terminals
Buy • Sell • Rent • Lease

EURODATA INC.
2574 Sheffield Road
Ottawa Canada K1B 3V7
613-745-0921
FAX 613 745 1172

HP 3000

ATP's • S/70
7937H • 7933H

Available in Quantity

Processors • Peripherals Systems

All In Stock - Immediate Delivery

All warranted to qualify for manufacturer's maintenance

BUY • SELL • TRADE
RENT • LEASE

ConAm Corporation
It's Performance That Counts!
800/643-4954 213/829-2277

CALL US LAST

GET YOUR BEST PRICE
Then Call
COMPUTER BROKERS, INC.
For The Best Deal
WE
Buy - Sell - Lease - Rent
New and Used IBM Equipment
AS400 - System 36, 38, 43XX

Call 800-238-6484
IN TN 901-372-2662

COMPUTER BROKERS, INC.
2978 Shelby St., Memphis, TN 38134
"Since 1974"

9370

All Models
New & Used
60 to 90
Upgrade Special
PH: 1-800-553-0592
in MN: 612-931-9000

WORLD DATA PRODUCTS
12800 Whitewater Drive, Suite 130
Minnetonka, Minnesota 55343 U.S.A.
FAX 612/931-0930

HP 3000
HP 1000
BUY
SELL
LEASE
TRADE-IN

20

Computer Solutions, Inc.
(201) 672-6000

WANTED

OBSOLETE AND EXCESS COMPUTER EQUIPMENT

Top Cash Paid

We purchase all types of obsolete or excess computer equipment and peripherals. We pay costs for all shipments as well as top prices.

Call today for a quote on your system

COMPU-SCRAP, Inc.
Randolph, MA 02368
(617) 341-2695
Call Collect!

WANG **SAVE 50% or more**

on WANG remanufactured
CPU's • OIS • PC • VS • PERIPHERALS

- Free Installation by your Wang technician
- Unconditionally guaranteed to the Wang Service Contract

wpb WORD PROCESSING BROKERAGE CORPORATION

Authorized WANG Remanufactured Dealer
1-800-223-9264

BUY & SELL
DATA GENERAL

Desktop to MV's
Systems - Upgrades
Options

AMES SCIENCES, INC.
(301) 476-3200
FAX: (301) 476-3396

BUY • SELL • RENT • LEASE

MEMOREX - TELEX

TERMINALS • PRINTERS
CONTROLLERS

MODELS 178 179 176 [illegible]
276 277 [illegible] 2670 [illegible]

CALL PETE KELLER

LEASING ASSOC. CORP.

(203) 978-1400

NIXDORF FOR SALE

2 8860/85's

32 Data Entry Terminals
1 600 Line Per Min. Printer
2 132 MB Discs

Full Communications Package
Machines have always been under Nixdorf Maintenance.

For more details call:
DOROTHY HOLTZER
212-686-1555

SUB-LEASE

NAS 8023
Mainframe
3.2 Mips
IBM Compatible

Available Immediately, Call:
800-441-1318, Ext. 2404
In PA 800-441-1317

It's the
Classified Marketplace
Reach Computer Professional Where They Shop For:

- Buy/Sell/Lease
- Hardware
- Software
- Peripherals/Supplies
- Communications
- Graphics/Desktop Publishing
- Time/Services
- Bids/Proposals/Real Estate
- Business Opportunity

CALL NOW

800-343-6474
(In MA., 508/879-0700)

Buy/Sell/Lease

IBM SPECIALISTS

SELL • LEASE • BUY

S/34 S/36 S/38 AS/400

4341 4342

800-251-2670

CMA COMPUTER MARKETING of Shannon Inc.

PO BOX 71 • 610 BRYAN STREET • OLD HICKORY, TENNESSEE 37138

PRIME

EXPERIENCED SYSTEMS AND PERIPHERALS

BUY-SELL-LEASE-BROKERAGE

NEW PLUG-COMPATIBLE DISK, TAPE, MEMORY

PLUS THE FASTEST I/O AVAILABLE ANYWHERE

1ST SOLUTIONS, INC.
11460 N CAVE CREEK ROAD
PHOENIX, AZ 85020
602-997-0997

ASK FOR DON SHIFRIS

VAX RENTALS

MV 3600
MV 3800/3900
VAX 6000 SERIES
VAX 8000 SERIES
Systems & Peripherals

- Fast Turnaround
- Dependable Products
- Upgrade/Add-On Flexibility

6 Months • 12 Months • 24 Months

BROOKVALE ASSOCIATES

(516) 273-7777 (206) 392-9878

We Buy & Sell DEC

Systems
Components

call:713
445-0082

Digital Computer Resale

800 Kenrick Ste C22
Houston Tx 77060

Software

QUATTRO® PRO

Borland International's NEW QUATTRO PRO, with VROOMM™ technology, is setting performance standards for power spreadsheet users. Join the spreadsheet revolution today and order QUATTRO PRO from Programmer's Connection at our special limited time sale price of $269*, regular price is $329.

To Order Call:
Programmer's Connection

USA 800-336-1166
Canada 800-225-1166
FAX 216-494-5260

Call for your FREE copy of our Buyer's Guide, *the CONNECTION*, with over 1,300 personal computer products.

*Special price expires December 31, 1989
Price includes UPS Ground shipping to the lower 48 states. Express rates are available.

$269

COMPUTERWORLDS's CLASSIFIED MARKETPLACE

Examines the issues while Computer Professionals examine your message.

Call for all the details.

(800) 343-6474
(In MA., 508/879-0700)

ROOMER2

Create computer room layouts and 3D views with your IBM PC or compatible. New library of computer components makes a quick and easy. From $195. Call for free brochure. Money Back Guarantee

Time/Services

COST-EFFECTIVE COMPUTING SERVICES for TODAY and ... TOMORROW

COMDISCO COMPUTING SERVICES CORP. provides you with low-cost, state-of-the-art computing services.

- IBM* CPUs and Peripherals
- Systems Software
  MVS/XA, TSO/E, ISPF, PDF, CICS, VM/XA VM/SP, HPO, CMS
- Application Software
  Database Management
  Application Development
  4GLs
  Statistical Analysis
  Graphics
- Multiple Communications Methods
- Technical Support
- Pricing to fit your needs

*IBM is a registered trademark of International Business Machines Corporation

For more information
Call Jeff Daum
201-896-2030

COMDISCO

MEETING THE MIS CHALLENGE

Litton Computer Services,
The Outsourcing Experts

Reliability, availability, security, response time . . . Litton Computer Services delivers flexible outsourcing solutions 24-hours a day instantly and cost-effectively on advanced, large scale information processing systems.

Twenty years experience brings you:

- Fixed Price Solutions
- Nationwide Network
- Migration Specialists
- Overflow Processing
- Laser Printing and Image/Forms Design
- Operating Systems Conversions
- Integrated Financial Applications
- Remote Facilities Management
- Micro/Mainframe Applications
- Major Third Party Software Packages

Let us show you how to contain costs without losing control.

CALL 1 800 PLAN LCS (1-800-752-6527)

DATA CENTERS
Boston Los Angeles Washington, D.C.

Litton Computer Services

INET. The Quality Outsourcing Solution

Achieving 20% to 40% savings by outsourcing their information processing requirements, our clients throughout the South and Midwest receive the reliability and security of 20 years Remote Computing experience backed by a $3.5 billion corporation that offers:

- Three IBM 3090/S computers
- MVS/ESA and VM/XA Systems
- DB2 and IMS Databases
- 24-hour Technical Help Desk
- Client Disaster Recovery
- Flexible/Custom Solutions
- Fixed Price Processing
- Remote Facilities Management
- Operating Systems Conversions
- Nationwide Network

Unlike Facilities Management, you maintain control while reducing your costs and improving your service.

Information Network Corporation • Dallas, Texas • 1-800-222-1590

ON-LINE WITH COMPUSOURCE

- Multiple centers
- MVS/XA VM, DOS
- RACF, CICS, IMS
- SAS, DB2
- Volume and term discounts
- Worldwide access
- Full technical support
- Laser printing
- Disaster recovery services

COMPUSOURCE
(919) 469-3325

REMOTE COMPUTING AND FACILITY MANAGEMENT SERVICES

- IBM MVS/XA Environment
- DB2, IDMS/R, Model 204 and 4GLs
- Professional Support Staff
- Experienced Migration Management Team
- Full Supporting Services
  — Media Conversion
  — Laser and Impact Printshop
  — Application Programming
- Simplified Pricing and Invoicing
- Technical Support — 24 Hours a Day — 7 Days a Week

May & Speh, Inc.

1501 Opus Place
Downers Grove, IL 60515-5713
(312) 964-1501
For More Information
Contact: Tony Ranieri

Let Us Be Your Data Center

Get high-quality computing service that can make a difference to your bottom line. From MCN Computer Services.

Full IBM compatability including:

MVS-ESA

VM/XA	DB2
CICS	IMS
TSO/E	IDMS/R
ROSCOE	QMF
	PROFS

Programmer Productivity Aids:

- FILE-AID
- CICS PLAYBACK
- dBUG-AID
- ABEND-AID
- CICS ABEND-AID

We provide state-of-the-art systems, software and security for major clients across the country. And we deliver high-quality, cost-effective services that include:

- Computer Electronic™ Printing
- Letter Shop

For more information, call Karen Gray at:

1-800-521-0444

MCN Computer Services, Inc.

5225 Auto Club Drive
Dearborn, MI 48126

INCOMPATIBLE COMPUTERS?

Disk Interchange Service Company specializes in transferring files between incompatible computers. Our format conversion systems support 1000+ formats.

- EXTRACT DATA TO DISKETTE
- REFORMATTED WORD PROCESSORS
- 3½", 5.25" & 8" FORMATS

Additional Services Include:
- Database & Spreadsheet Conversions
- Custom Programming/Data Reformatting
- Data Entry

Disk Interchange Service Co. (DISC)
2 Park Drive • Westford, MA 01886
(508) 692-8050

VAX/VMS COMPUTER TIME

Fortran, C, Cobol, Pascal, Basic and other DEC layered products available.

Flat monthly & annual rates.

Local access for most of (213), (714), and (818).

Telenet available nationwide on larger accounts.

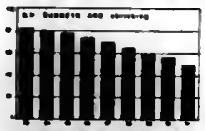
MedCom Info Systems, Inc.
Phone: (714)996-9999
Fax: (714)961-8700
BBS: (714)996-6666 GO VAX

Time/Services

NATIONAL COMPUTER SERVICES, INC.

176 W. Adams St., Suite 1700 • Chicago, Illinois 60603
Telephone 312-781-9000 • Toll-free 800-992-7171
FAX: 312-372-5157

OUTSOURCING
IBM/AMDAHL USERS



WHEN COST-CUTTING GETS OVERWHELMING
YOU CAN CUT COST AND IMPROVE SERVICE

OUR SERVICES AND PRICES ARE BETTER THAN
ANYONE ADVERTISING IN THIS SECTION

COMMITTED TO CONTINUAL DEVELOPMENT & IMPROVEMENT
OF OUR SERVICES AND PRODUCTS . . . . . TO BENEFIT YOU

NCS

FOR MORE INFORMATION
CALL JIM NEAGLE
312-781-9000
800-992-7171

MULTIPLE IBM 3090 MACHINES

DEDIC[illegible]ERVICE
TIM[illegible]VICE
DEDIC[illegible]ERVICE

24 Hour/7 D[illegible] Full-Service

Full-S[illegible] R[illegible]

Help[illegible] M[illegible]
T[illegible] V[illegible]
C[illegible] CMS [illegible]et
C[illegible]ng
D[illegible]cility

Flexib[illegible]hs: S[illegible]g Term

CO[illegible]CES

Call Pat H[illegible]d [illegible]) 326-5240

RECRUI[illegible].S.A., INC.

COMPUTER TIMESHARING

- We locate computer time.
- We find your lowest prices.
- All mainframes.
- NEVER a charge to the Buyer.
- Our fees paid by the Seller.
- Nationwide service since 1968.

Call Don Selden at
Computer Reserves, Inc.
(201) 666-6100

EXCLUSIVE OFFERING
FREE TRIAL PERIOD—MAJOR COST SAVINGS

FULL SERVICE COMPUTER PROCESSING
IBM 3090 Processor-MVS/XA & VM/HPO, TSO, CICS

- Broad Software Support Product Line
- Domestic & International Network
- PROFS, Decision Support Products
- Data Base Management
- Banking/Financial Services

CALL 1-800-443-8797
Guaranteed Lowest Rates in the Industry
Allowances for Peak/Cyclical Processing

FINANCIAL TECHNOLOGIES
CHANTILLY, VIRGINIA

DATA CONVERSION

- Optical Scanning
- Disk Conversions
- Tape Conversions

Impressive Service at
Impressive Prices!

1-800-426-3776
or
1-502-426-9448

MEGA GROUP, INC. ANNOUNCES OUTSOURCING .... COMPUTING SERVICES AT LOW PRICES

Our Company can provide fixed-priced data processing services. Our services will be as good as your I.S. department at substantially lower costs. We have over 20 years of experience in the data processing industry serving a wide variety and size of companies. No company is too large or too small.

To obtain more information, please call:

(609) 596-8391

Software Packaging

- Disk duplication
- All formats
- EVERLOCK copy protection
- Label/sleeve printing
- Full packaging services
- Warehousing
- Drop shipping
- Fulfillment
- 48-hour delivery
- Consultation & guidance

800-243-1515
Star-Byte, Inc.
2880 Bergey Rd Hatfield, PA 19440

REMOTE COMPUTING OUTSOURCING

- MVS/XA
- VM/370
- DOS/VSE
- CICS
- TSO
- CMS
- DB2
- IMS/DBDC

OVER 150
SOFTWARE PRODUCTS
- DEVELOPMENT
- DEBUGGING
- PRODUCTIVITY
- PERFORMANCE

- TELENET
- TYMNET
- SEARSNET
- IBM INFORMATION NETWORK

EXTRAORDINARY
CUSTOMER SERVICE
MIGRATION
MANAGEMENT

GIS
INFORMATION SYSTEMS, INC

815 Commerce Drive
Oak Brook, IL 60521
708-312-3636
New England
617-595-8000

CONSULTING SERVICES

Situation:

- Company is downsizing and integrating computer operations
- Information System resources are limited
- You need a business justification for your outsourcing project
- Vendor and proposal evaluations are time consuming

Call or write to: Howard Shields, President

A. D. S. CONSULTING INC.

We offer you:

- Over twenty years experience in the computer industry
- "Hands on/open" based on defined business objectives
- Vendor interface and proposal evaluation
- Facilities integration/control, project related, recommendations
- Consultative approach to achieving your automation goals

Honeywell to IBM
Assembler to Cobol
CICS Macro to Command
DOS to MVS
Any Cobol to any Cobol

Professional staff,
experienced in conversion.

Specific methodologies for:
- Conversion Project Management
- Feasibility & Planning
- Technical Conversion

NEOSYNETICS, INC.
3158 Des Plaines Avenue
Des Plaines, Illinois 60018
312/299-0900

ICOTECH

MVS/XA	VTAM
TSO/ISPF/SDSF	FILE-AID
CICS	INTERTEST
ADABAS	SAS
DB2	SOFTWARE
ACF2	ADCS
LIBRARIAN	SAVER

- 24 hour availability
- International access
- Quarter terminal support staff
- Uninterrupted Power Supply
- Certified on-site vault
- Disaster recovery
- Impeccable service

RGA DATA CONVERSION CENTER

Tape, data, macros, disks, mainframes, word processors, typesetting, and more

- Same day service
- IBM 4300 on premises
- Conversion to/from all systems
- Hundreds of conversion programs
- Customized programming
- Corporate Accounts Welcomed

(212) 986-1090
Ralph Garner Associates, Inc.
215 Park Avenue South New York, NY 10003
Professional services since 1967

It's the Classified Marketplace

Reach Computer Professionals Where They Shop For:

- ☐ Buy/Sell/Lease
- ☐ Hardware
- ☐ Software
- ☐ Peripherals/Supplies
- ☐ Communications
- ☐ Graphics/Desktop Publishing
- ☐ Time/Services
- ☐ Bids/Proposals/Real Estate
- ☐ Business Opportunity

CALL NOW
800-343-6474
(In MA., 508/879-0700)

CLASSIFIED MARKETPLACE
Where Computer Professionals Shop
(800) 343-6474
(In MA, 508/879-0700)

INTERNATIONAL NETWORK

- COMPUTING SERVICES (IBM) VM/VSE HF3000)
- FACILITIES MANAGEMENT (IBM HP)
- CONTRACT PROGRAMMING (S/370 AS400 HP3000)

★ LOWEST PRICES ★

Graphics/Desktop Publishing

PC SCREEN TO BIG SCREEN

Look to BOXLIGHT for the Largest Selection of Displays

BOXLIGHT CORPORATION

NEW AND USED RAISED FLOORING

Immediate Delivery
Quality Installation
Raised Computer Floors
One Chelsea Street
Westwood, NJ 07675
(201) 666-6200
FAX (201) 666-3743

Slides Overheads Hard Copies

From your IBM PC Files $5.00

1-800-232-5411
SlideImagers™
Atlanta, Georgia

The CLASSIFIED MARKETPLACE

Reach Over 612,000
Computer Professionals
When They Reach For

COMPUTERWORLD
(800) 343-6474
(In MA, (508) 879-0700)

Identifying unknown problems

Highlighting needs through critical incidents can facilitate training

BY STEWART L. STOKES JR.
SPECIAL TO CW

The need for a needs analysis before launching a training program is an article of faith in most information systems organizations. And well it should be; as the saying goes, a problem identified is a problem half-solved. However, there's the rub — a conventional needs assessment may fail to uncover an organization's real training needs, especially when it comes to deficiencies of management and interpersonal skills.

This situation is aggravated by the fact that in many IS organizations, managerial and interpersonal skills are in short supply: IS professionals tend to know more about data communication than human communication. However, when it comes to bringing systems projects in on time and under budget, it is still the people skills that make the difference.

Where does this leave the IS professionals who are responsible for analyzing an organization's need for people skills? I recommend they try to tackle them with the help of an analysis based on "critical incidents."

Consider this example:

The director of an IS department asked me to design a program of instruction in management and interpersonal skills for his project managers.

"They know all about project control tools, and they believe that is all they need to know," the IS director said. "What they are missing are the people skills. They need to build project teams where people actually collaborate rather than settle for arm's length cooperation. But I do not know what skills they need in order to build and manage collaborative teams. In all honesty, I am not good at doing that myself."

At least this IS director was honest and objective, and that is a great place to start. I worked closely with the IS training people to design and conduct a critical incident analysis. The process is based on the belief that while we may not know what we need, we do know what we are trying to accomplish, and we know which critical incidents are hindering us and which are helping us in trying to achieve our goals.

We first identified the departments and other groups that worked with the project managers and their teams. These included users, senior IS managers, fellow technical managers, IS staff members and others. We then formed focus groups of five to seven people to represent each group. I designed an interview guide that incorporated several open-ended questions intended to focus group discussions on the behavior of the project managers and how it affected what the group members wanted to accomplish. In addition to the focus groups, I interviewed the project managers, posing similar questions.

The results? Each of the groups cited incidents reflecting difficulties the project managers experienced in handling interpersonal relationships.

In negotiating project requirements, for instance, conflicts arose and then escalated. Several participants also pointed out that they were continually covering the same ground in project meetings. "No wonder we have trouble meeting deadlines," one of them said. The reason was a lack of skill in holding meetings, specifically in listening to other people.

THE PROCESS IS based on the belief that while we may not know what we need, we do know what we are trying to accomplish, and we know which critical incidents are hindering us and which are helping us in trying to achieve our goals.

The incidents pointed to the need for the project managers to develop skills in managing conflict among themselves and between them and other group members. The managers also needed to learn to listen for the real messages in human communication and provide constructive feedback.

Also apparent was the need for the project managers to understand more about the business requirements that their projects were designed to address. The project managers found it difficult to get close to the users because they did not understand their business environment. The result was a widening gap in relationships between IS people and users.

Of particular significance was the fact that none of the project managers thought that they had any need for training in conflict management, effective listening or business awareness. When faced with the results of the discussions, however, they realized that their own perceptions were not as important as the perceptions of their colleagues.

The final step was to design and conduct a program of education in management and interpersonal skills based on these deficiencies. This step never would have taken place had we been content to merely ask the project managers, or their director, what they needed.

Stokes is a senior vice-president of QED Information Sciences, Inc. in Wellesley, Mass.

MSA Trainer

for a major national organization headquartered in Washington, D.C.

Price Waterhouse has been retained by one of our major clients in Washington, D.C. to assist in the search for a qualified MSA Financial Systems Trainer.

The successful candidate will be responsible for all staff training and user support relating to MSA's Government Series software, and several in-house developed financial systems. This is a highly visible position and calls for significant MSA Financial Systems experience which should include designing and conducting MSA-related training programs. A B.S. degree, strong communication skills and a self-motivated disposition are also required.

The client offers a highly competitive salary, an excellent benefits package and relocation assistance.

Please send your resume, including salary requirements, in confidence to: Price Waterhouse, 1801 K Street, N.W., Suite 1000, Washington, D.C. 20006, ATTN: JRM.

The client is an Equal Opportunity Employer

Price Waterhouse

We Cover All the Bases.

For over 16 years, On-Line Software has provided the finest software training to IBM® users. We offer the most current courses, taught at the latest releases.

Classes offered:

- CICS
- VSAM
- DB2
- IMS/VS DB (DL/1)
- SQL
- VTAM

We also offer training in the use of our products—RAMIS,® UFO,® InterTest® and VERIFY.® All courses are held at locations throughout the U.S. and Canada, and are also available on-site.

For course details, or for more information, call the Education Department toll-free at 800-642-0177. In Canada, call 201-592-0009.

Register by November 30, 1989 and—upon completion of a course—receive a FREE copy of Command-Level Programming by William Bruno and Lois Bosland, a $19.95 value.

Redeem this coupon for your free book. Only original coupon will be accepted.

IBM is a registered trademark of International Business Machines. (#3-19/13/89)

On-Line Software INTERNATIONAL

The Safe Buy.

Training

ReXX Programming for MVS Automated Systems Operation

A 3-day intensive class.
ReXX design and development.
Includes:
demos, comprehensive labs.

New Jersey.....December 4-6, 1989
Los Angeles.....January 9-11, 1990

Register by calling Sharon at (213) 578-1147

Sponsored by: *MVS Software, Inc.*
Offered by: *Next Generation Technology, Inc.*

NATURAL 2 *Tips & Techniques*
★
NATURAL 2 *Developers Handbook*
★
NATURAL 2 *Self Study Guide*
★
Available from
W H & O
PO Box 68-335
Wellesley, MA 02181
(617) 239-0682
FAX 617-239-0627

COMPUTERWORLD'S

November 20th

Training Editorial Topic

CBT vendor consolidation & the impact on users

Executive Report
ISDN products

Computer Careers Section: Outlook for IS trainers

Ad Close: Nov. 14

Peripherals/Supplies

HEWLETT PACKARD
GENUINE TONERS
$81.50
For Same Day Shipped Calls
+1-800-22-TONER
+1-800-228-8637
TONERS PLUS

CLEAR YOUR DESK!

CPU Floor Stands
$95.00
Sturdy, Attractive
Clear Acrylic
Adjustable - 4' to 7'

Atlantic Research
800/543-6323
In VA, 703/642-4131

FOR SALE
MAGNETIC TAPE

Tape to cartridge conversion recently completed. We need to sell 10,000 high quality, 3 to 4 year old tapes, mostly Memorex Quantum HD.

Call Bill or Mark

SAFEWAY
STORES, INCORPORATED
(801) 973-4252

Bids/Proposals/Real Estate

MISSISSIPPI CENTRAL DATA PROCESSING AUTHORITY

Sealed proposals will be received by the CDPA, 301 N. Lamar St., 301 Building, Suite 508, Jackson, MS 39201 for the following equipment and services:

Request for Proposal No. 1001, due Tuesday, November 28, 1989 at 3:30 p.m. for the acquisition of consulting services to convert an Informix-based system to run under Ryan-McFarland COBOL-85 at the STATE FIRE ACADEMY.

Request for Proposal No. 1002, due Tuesday, November 28, 1989 at 3:30 p.m. for the acquisition of 34 IBM®-based microcomputers, 3 IBM®-based microcomputers, 21 printers and various software packages for DELTA STATE UNIVERSITY.

Request for Proposal No. 1003, due Tuesday, November 28, 1989 at 3:30 p.m. for the acquisition of professional consulting services for assistance with the implementation of a Commercial Driver Licenses Information System for the MISSISSIPPI HIGHWAY SAFETY PATROL.

Detailed specifications may be obtained from the CDPA office. The CDPA reserves the right to reject any and all bids and proposals and to waive informalities.

Patsy Stanley @ (601) 359-6604

REQUEST FOR PROPOSALS

The Information Services Department of Phoenix Leasing Incorporated, 2401 Kerner Blvd., San Rafael, California 94901, will accept proposals for the acquisition of twenty laser printers over the next twelve months. These printers must 1) be compatible with the VAX/VMS environment and with Word-11 word processing software, 2) have three input trays and 3) have product support, parts inventory and source of expendable supplies local to our San Rafael site.

Computerworld's
Classified Marketplace
gives you buyers with extensive purchase influence.

That's because Computerworld's Classified Marketplace reaches MIS/DP professionals who have extensive involvement in volume purchasing. In fact, a full 95% are involved in purchase decision making for their organizations. They determine needs, evaluate technologies, identify solutions, and select products and vendors for the entire range of information systems, as well as related products and services.

So if you're selling computer products and services, advertise in the newspaper that delivers buyers with volume purchasing influence. Advertise in Computerworld's Classified Marketplace!

For more information, call
800/343-6474
(in MA, 508/879-0700)

Business Opportunities

FOR SALE

Contract Programming Services Firm:

- *$500K sales average, Inc. since 1985*
- *Above average earnings*
- *Two western NY state locations*
- *Extensive "Approved Vendor" status*

Co. seeking merger or acquisition to capitalize on major market opportunities. Write:

CW-10892, Computerworld, Box 9171, Framingham, MA 01701-9171

Computerworld's

Classified Marketplace

delivers your message to companies that plan to buy your product or service.

From PCs to minis, mainframes to supercomputers, Computerworld's readers buy products across all ranges of today's computers. So if you're selling, advertise in the newspaper that delivers readers that plan to buy YOUR product or service. Advertise in Computerworld's Classified Marketplace!

For more information, call:

800/343-6474
(in MA, 508/879-0700).

Advertise Your Products In The

CLASSIFIED MARKETPLACE

Featuring:

- ☐ Buy/Sell/Lease
- ☐ Hardware
- ☐ Software
- ☐ Peripherals/Supplies
- ☐ Communications
- ☐ Graphics/Desktop Publishing
- ☐ Time/Services
- ☐ Bids/Proposals/Real Estate
- ☐ Business Opportunities

Reach over 612,000 information systems professionals by placing your company's message in

CLASSIFIED MARKETPLACE.

Name:_____
Title:_____
Company:_____
Address:_____
City:_____
State:_____ Zip:_____
Telephone:_____
Ad Size:
_____ columns wide x_____ inches deep.
☐ I am enclosing ad material with this form.

Return this form and advertising material to:

Computerworld
Classified Marketplace
375 Cochituate Road, Box 9171
Framingham, MA 01701-9171

(800) 343-6474
(in MA., (508) 879-0700)

COMPUTERWORLD
CLASSIFIED MARKETPLACE
Where all computer buyers and sellers can go to market.

SALES OFFICES

Publisher/Fritz Landmann

Senior Vice-President/Associate Publisher/Val Land, COMPUTERWORLD, 375 Cochituate Road, Box 9171, Framingham, MA 01701-9171, (508) 879-0700

BOSTON: Regional Vice-President - North/David Peterson, Sr. District Managers/Bill Cadigan, Sherry Driscoll, District Manager/John Watts, Sales Assistants/Alice Longley, Lisa Bonaccorso, **COMPUTERWORLD**, 375 Cochituate Road, Box 9171, Framingham, MA 01701-9171 (508) 879-0700

CHICAGO: Regional Vice-President - Midwest/Kevin McPherson, Senior District Manager/Lary Cravens, Sales Assistants/Kathy Sullivant, Karol Lange, **COMPUTERWORLD**, 10400 West Higgins Road, Suite 300, Rosemont, IL 60018, (312) 827-4433

NEW YORK: Regional Vice-President - East/Barrie Hockswender, District Managers/Fred LoSapio, Paula D'Amico, Sales Assistants/Linda Pierros, Patricia DeBiase, **COMPUTERWORLD**, Mack Center 1, 385 West Passaic St., Rochelle Park, NJ 07662 (201) 967-1350

LOS ANGELES: Regional Vice-President - West/Jan Harper, Southwestern Regional Manager/Carolyn Knox, Sales Assistant/Bev Raus, **COMPUTERWORLD**, 18008 Sky Park Circle, Suite 145, Irvine, CA 92714 (714) 261-1230

SAN FRANCISCO: Regional Vice-President - West/Jan Harper, Senior District Managers/Erma Chamberlain, Michele O'Connor, District Manager/Alicia Serbian, Sales Assistants/Chris Kobayashi, Hunt Zeeman, Carol Lacasse **COMPUTERWORLD**, 500 Airport Boulevard, Suite 400, Burlingame, CA 94010 (415) 347-0555

ATLANTA: Regional Vice-President - East/Barrie Hockswender, District Manager/Melissa Christe Neighbors, Sales Assistant/Debra Brown, **COMPUTERWORLD**, 1400 Lake Hearn Drive, Suite 330, Atlanta, GA 30319 (404) 394-0758

DALLAS: Regional Vice-President - Midwest/Kevin McPherson, Southwestern District Manager/Darren Ford, Sales Assistant/Brenda Shipman, **COMPUTERWORLD**, 14651 Dallas Parkway, Suite 304, Dallas, TX 75240 (214) 233-0802

WASHINGTON, D.C.: Regional Vice-President - East/Barrie Hockswender, District Manager/Paula D'Amico, **COMPUTERWORLD**, Mack Center 1, 385 West Passaic St., Rochelle Park, NJ 07662 (201) 967-1350

CLASSIFIED ADVERTISING SALES:
Classified Advertising Director/John Corrigan, Marketing Director/Derek E. Hultsky, 375 Cochituate Rd., Framingham, MA 01701-9171 (800) 343-6474, in MA (508) 879-0700

PRODUCT CLASSIFIED ADVERTISING:
East: Account Manager/Paul Bonanno, 375 Cochituate Rd., Framingham, MA 01701-9171 (800) 343-6474, in MA (508) 879-0700
Midwest: Account Manager/Mate Kayes, 375 Cochituate Rd., Framingham, MA 01701-9171 (800) 343-6474, in MA (508) 879-0700
West: Account Executive/Bill Cremins, 375 Cochituate Rd., Framingham, MA 01701-9171 (800) 343-6474, in MA (508) 879-0700

RECRUITMENT ADVERTISING SALES OFFICES:
New England: Regional Manager/Nancy Percival, 375 Cochituate Rd., Framingham, MA 01701-9171 (800) 343-6474, in MA (508) 879-0700, Account Executive/Andrew Rowe, (800) 343-6474, in MA (508) 879-0700
Mid-Atlantic: Regional Manager/Warren Kolber, Mack Center 1, 385 West Passaic St., Rochelle Park, NJ 07662 (201) 967-1350, Sr. Account Executive/Jay Novack, (800) 343-6474
Sunbelt-Atlantic: Regional Manager/Kristie Kraus, 8304 Professional Hill Drive, Fairfax, VA 22031 (703) 573-4115, Sr. Account Executive/Pauline Smith (800) 343-6474
Midwest: Regional Manager/Pat Powers, O'Hare Corp. Ter 1 10400 W. Higgins Rd., Ste. 300, Rosemont, IL 60018 (312) 827-4433, Account Executive/Ellen Casey (800) 343-6474
West: Regional Manager/Barbara Murphy, 18008 Skypark Circle, Ste. 145, Irvine, CA 92714 (714) 250-0164, Account Executive/Christopher Glenn (800) 343-6474
DISTRICT RECRUITMENT CAMEOS:
East: Account Manager/Norma Tamburrino, Mack Center 1, 385 West Passaic St., Rochelle Park, NJ 07662 (201) 967-1350
West: Account Executive/Jill Hetherl, 18008 Skypark Circle, Ste. 145, Irvine, CA 92714 (714) 250-0164
IDG INTERNATIONAL MARKETING SERVICES:
Managing Director/Frank Cutitta, **COMPUTERWORLD**, 375 Cochituate Road, Box 9171, Framingham, MA 01701-9171 (508) 879-0700
West Coast Marketing Manager/Leslie Sasser, 3350 West Bayshore Road, Suite 201, Palo Alto, CA 94303 (415) 424-1001

CW PUBLISHING/INC.

An IDG Communications Company

Fritz Landmann/President

Computerworld Headquarters: 375 Cochituate Road, P.O. Box 9171, Framingham, MA 01701-9171
Phone: 508-879-0700. Telex: 95-1133. FAX: 508-872-8864

Senior Vice-President/Associate Publisher, Val Land

FINANCE Senior Vice-President/Chief Financial Officer, Matthew Smith. Controller, Mark Sullivan.
SALES Advertising Director, Carolyn Novack. Classified Advertising Director, John Corrigan. Marketing Director, Derek E. Hultsky.
Display Advertising Production Manager, Maureen Hurley. Classified Operations Manager, Cynthia Delany.
MARKETING Vice President/Business Development, Kevin Harold. Manager, Marketing Communications, Mary Doyle. Account Manager, Marketing Communications, Elizabeth Phillips. Manager, Trade Show Communications, Audrey Shoran.
CIRCULATION Director of Circulation Management, Maureen Burke. Director of Circulation Promotion, Carol Spach.
PRODUCTION Vice President/Manufacturing, Leigh Hornan. Assistant Production Director, Carol Polach. Production Manager, Beverly Wolff. Art Director, Tom Monahan.
PUBLISHER'S OFFICE Assistant to the President, Karen Elliot. Assistant to the Senior Vice-President, Libby Levinson.

FOREIGN EDITORIAL/SALES OFFICES

ARGENTINA: Ruben Argento, CW Communications/Argentina, S.A., Av. Belgrano 480-Piso 9, CP 1092 Buenos Aires, Phone: (01) 0 38 134-9583. Telex: (390) 22644 (BAZAN AR).

ASIA: S.W. Chan, Asia Computerworld Communications Ltd., 701-4 Hom Cheung Bldg., 64 Jaffe Road, Wanchai, Hong Kong, Phone: (011) 852 5 861 3238. Telex: (780) 73827 (COMASI HX). FAX: (011) 852 5 86 10853.

AUSTRALIA: Alan Rowe, IDG Communications Pty. Ltd., 27-43 Wormer Street, Crows Nest, NSW 2065, Phone: (011) 61 2 43861 88. Telex: (790) AA74752 (COMNEW). FAX: (011) 61 2 439 6912.

AUSTRIA: Manfred Weber, CW Publikationen Verlags Ges.m.b.H., Zieglergasse 6, A-1070 Wien, Austria, Phone: (011) 43-222-93 16-31-0. Telex: (847) 115642 (SCHVI). FAX: (011) 43 222 93 05 88 33.

BRAZIL: Ray Presot, Computerworld do Brasil Ltda., Praia Flamengo, 154/29 Andar, 2081 Rio de Janeiro, RJ Brasil, Phone: (011) 55 21 240 6235. Telex: (391) 27 30830 BR. Rua Paula Ferreira, 486/3 Andar-CEP 04634, Sao Paulo, Brasil. Tel: (011) 55 11 533 8140. Telex: (391) 1123017 (NORD BR).

COLOMBIA: Rodrigo Parrales, La Prensa Ltda, Telex: 439 Tel: 86 A/99, Apartado 89800, Bogota, D.E. Colombia. Tel: (011) 571 271 9189.

DENMARK: Preben Engell, IDG Denmark A/S, Nejrobanen 4 DK-2600 Valby Denmark. Tel: (011) 45 39 442800. Telex: (809) 31388. FAX: (011) 45 39 442888.

FRANCE: Francois Chassenieux, IDG Communications France, Immeuble La Fayette, 2, Place des Vosges, Cedex 05, 92051 Paris La Defense, France. Tel: (011) 33 1 49074 7500. Telex: (842) 612237F. FAX: (011) 33 1 4904 7500.

HUNGARY: Dezso Futasi, Computerworld Informatika Co., Inc. Pf. 258, 1536 Budapest, Hungary. Phone: (011) 36 1 229 458. Telex: (841) 226397 (HSKP H). FAX: (011) 361 403 388.

INDIA: Pradeep Gupta, Cyber Media (India) Ltd., D-74 Panchsheel Enclave, Aga Suite, 110017, India. Tel: (011) 91 11 643 4860. Telex: (953) 0317 1344 (BBD IN). FAX: (011) 91 11 644 3422.

ITALY: Umberto Paolucci, Computer Publishing Group S.R.L., Via Vida 7 20127 Milano, Italy. Phone: (011) 39-2-28134432. Telex: (842) 235018. FAX: (011) 39 2 284 0737.

JAPAN: Eiji Yamamura, IDG Communications/Japan, Kyodo TBR Bldg., 5-7 Roppongi, Chuo-ku, Tokyo 102, Japan. Tel: (011) 81 3 222 0411. Telex: (781) 252 4217. FAX: (011) 81 3 222 0658.

MEXICO: Hanry Hopkins, Computerworld Mexico S.A. de C.V., Damaso 31-2, Mexico City 7 D.F. Colonia Benito, 03720 Mexico. Tel: (011) 52 5 514 4218 or 6305. Telex: (383) 177 1200 (KOHAME). FAX: (011) 525 611 4890.

THE NETHERLANDS: Wout Boerstra, IDG Communications B.V., 55 Piet Heinkade, 1019 HC Amsterdam, The Netherlands. Tel: (011) 31 20 634 0430/634 5819. Telex: (844) 18242 (CWCOM NL). FAX: (011) 31 20 366 3568.

NEW ZEALAND: Martin Taylor, IDG Communications Ltd., 2nd Floor, 19 Augustus Terrace, Parnell, Auckland 1, New Zealand. Phone: (011) 64-9-779-002. Fax: (011) 64 9 774 804.

NORWAY: Morten Hansen, CW Haugs A/S, Hovdingvn 43, 0676, Oslo 5, Norway. Phone: (011) 472 647725. Telex: (856) 78476 (CW NOR N). FAX: (011) 47 268 0169.

PEOPLE'S REPUBLIC OF CHINA: Shen Yan, China Computerworld, 74 Qu Qo Road, Box 799, Beijing 100039, People's Republic of China. Tel: (011) 47 81 0044. Telex: (716) 222214 (CCW CN).

SINGAPORE: Asia Computerworld Communications Ltd., 11-08/10 Tower block, Grid Hill Road, 91 Havelock Road, Singapore 1130, Republic of Singapore. Phone: (011) 65 283 4444. Telex: (789) 88 37080 (Comnet). FAX: (011) 65 280 4288.

SOUTH KOREA: Young S. Green, IS Tech Information, Inc., 3rd Area Youngdon Building, 1600-7 Socomo 3 Dong, Seocho-gu, Seoul 137 073 Korea. Tel: (011) 82 2 588 6822. FAX: (011) 82 2 587 6823.

SPAIN: Pepe Zapata, CW Communications, S.A., Mateo Cano, 1/6, 6B 28010 Madrid, Spain. Phone: (011) 34 1 419 8814. Telex: (831) 45527 (CW E). FAX: (011) 341 419 61 04.

SWEDEN: Bengt Stenstrom, CW Communications AB, Sodra Hamngatan 27, S 110 41 Stockholm, Sweden. Tel: (011) 46 8667 8180. Telex: (854) 14804 0 (NORACW). FAX: (011) 46 8660 3132.

SWITZERLAND: Gerhard Schneider, CW Publikationen AG, Hofwiesenstrasse 345, Postfach 350, CH 8030 Zurich, Switzerland. Phone: (011) 41 1 68 19 77. Telex: (845) 810 710 (CWO CH). FAX: (011) 41 1 68 1128.

TAIWAN: David Chu, IDG Communications/Taiwan, 6F-2, No. 123 Su Kwo Road, Taipei, Taiwan, Republic of China. Tel: (011) 886 2777 5356. FAX: (011) 886 2777 5376.

UNITED KINGDOM: Martin Durham, CW Communications Ltd., 66 Chiltern Ho Rd., London, W12 8AT, United Kingdom. Phone: (011) 44 1 831 2252. Telex: (851) 392348 (TREFUS G). FAX: (011) 44 1 400 2347.

UNITED KINGDOM: Colin Smith, Chop Smith & Partners, 68 Abbeville Mews, 88 Clapham Park Road, London SW4 7BX, United Kingdom. Phone: (011) 44-1-978-1440. FAX: (011) 44-1-978-1893.

VENEZUELA: Kirsten von Hahn Hasty, IDG Communications C.A., C.S.L. Ibara Mercantilon, Piso 13, Oficina H, Av. Libertador, Caracas, Venezuela. Phone: (011) 58 2 72 76 39. FAX: (011) 58 2 726476.

WEST GERMANY: Reinhold Eberstal, IDG Communications Verlag AG, Rosenheimer Str. 145, Postfach 80 08 78, 8000 Munich 80, West Germany. Phone: (011) 49 89 920090. Telex: (841) 5213300 (COMW D). FAX: (011) 49 89 3 65 95108.

IDG COMMUNICATIONS/INC.

Patrick J. McGovern	Arnold Lobisch	Walter Boyd	William P. Murphy
Board Chairman	Vice-Chairman	President	Vice President/Finance

Computerworld is a publication of IDG Communications, the world's largest publisher of computer-related information and the leading global provider of information services on information technology. IDG publishes over 130 computer publications in 40 countries. Fifty million people read one or more IDG publications each month. IDG's publications include: ARGENTINA's Computerworld Argentina, Infoworld Argentina; ASIA's Computerworld Asia, Infoworld Asia; AUSTRALIA's Computerworld Australia, Australian Macworld, Australian PC World, Australian Reseller News, Computerworld New Zealand, Infoworld Australia; AUSTRIA's Computerworld Osterreich, PC Test; BRAZIL's Computerworld, Mundo IBM, PC Mundo; CANADA's Computer Data; CHILE's Computerworld, Informatica Total; COLOMBIA's Computerworld Colombia; DENMARK's Computerworld Danmark, PC World Danmark, Radio Data; ECUADOR's Computerworld Ecuador; EGYPT's Computerworld Middle East, PC World Middle East; FINLAND's Mikro Bitti, Tietoviikko, Tietoverkko; FRANCE's Le Monde Informatique, Distributique, InfoPC, Reseaux & Systemes; GERMANY's Computerwoche, Computerwoche Focus, Computerwoche Extra, Computerwoche Karriere, PC Welt, PC Welt Berlin; GREECE's Computerworld Greece, PC World Greece; HONG KONG's Computerworld Hong Kong, PC World Hong Kong; HUNGARY's Computerworld Szamitastechnika; INDIA's Computerworld India, PC World India; IRELAND's Computerworld Ireland; ISRAEL's Computerworld Israel, PC World Israel; ITALY's Computerworld Italia, Lotus Magazine, Macworld Italia, Networking Italia, PC Shopping Italia, PC World Italia; JAPAN's Computerworld Japan, Information Systems World, Macworld Japan, Nikkei Personal Computing, PC World Japan; KENYA's East African Computer News; KOREA's Computerworld Korea, Macworld Korea, PC World Korea; MEXICO's Computerworld Mexico, PC World Mexico; THE NETHERLANDS' Computerworld Nederland, PC World Nederland; NEW ZEALAND's Computerworld New Zealand, PC World New Zealand; NIGERIA's PC World Nigeria; NORWAY's Computerworld Norge, Lotus Magazine, Macintosh Norge, PC World Norge; PEOPLE'S REPUBLIC OF CHINA's China Computerworld, PC World China; PERU's Computerworld Peru, PC World Peru; POLAND's Computerworld Poland, PC World Poland; PORTUGAL's Cerebro/PC World Portugal, Computerworld Portugal, Network World Portugal; ROMANIA's Computerworld Romania, PC World Romania; SINGAPORE's Computerworld Singapore, PC World Singapore; SOUTH AFRICA's Computer Mail (CIO), Computerworld South Africa, PC World South Africa; SOUTH KOREA's Computer World Korea, PCWorld Korea; SPAIN's Amiga World, Commodore World, Computerworld Espana, Macworld Espana, PC World Espana; SWEDEN's Attack, ComputerSweden, Corporate Computing, Datalagring, Lokala Nat, Mikrodatorn, Natverk & Kommunikation, PC World Sverige, Publishing & Design (DTP), Svenska Unix-Varlden; SWITZERLAND's Computerworld Schweiz, Macintosh Schweiz, PC Tip; TAIWAN's Computerworld Taiwan, PC World Taiwan; THAILAND's Thai Computerworld; TURKEY's Computerworld Turkiye, PC World Turkiye; UNITED KINGDOM's Computing Unix World, Lotus Magazine, Macintosh Europe, Macintosh User, Network News, Network Computing, PC Business World, PC Direct, PC Home, PC Plus, PC User, Portable Computer Europe, PC Advisor, Personal Computer World, Publish!, Sunworld; UNITED STATES' Amiga World, IDG Books, Inmac, IDG Today, Lotus Magazine, Macintosh Europe, Macintosh User, Network News, Network Computing, Digital News, Federal Computer Week, Focus Publications, Game Pro, ICONS, InfoWorld, Macworld, Network World, PC Games, PC Letter, PC World, Portable Computer Europe, PC Advisor, Personal Computer World, Publish!, Sunworld; USSR's Computerworld Moscow, World Games; VIETNAM's Computerworld, PC World, Reseller.

ADVERTISERS INDEX

ADP	101
Alabama Development Group	62
AT&T	80-81, SR/20, 110-111
AT&T Paradyne	41,43
Avatar Corp	54
Banyan Systems	70
Beta Systems Software	12
BMC Software	40
Bull Worldwide Information Systems	50-51, 86-99
Businessland	28-29
Candle Corp	24
Chinon America	56
Codex	84-85, SR/12-SR/13
Communication Networks	33
Compuserve Data Technologies	10
Computer Associates	3, 42, 75
Computer Corporation of America	98
CPI	66
CW Circulation	101
CW Response Cards	132
Data General	96-97
Digital Equipment Corp	SR/30-SR/31
Eastman Kodak	90
EMC Corp	SR/2
Epson America	76-77
Exide Electronics	108-109
General Datacomm	19
GTE	106
Hayes Microcomputer	102-103
Hewlett-Packard	20-21, 53, 55, 57, 59
IBM	64-65, SR/4-SR/5, SR/32-SR/33
IDC Corp	94
IDEAssociates	46, SR/36-SR/37
IDP	7
Index Technology Corp	SR/38
Informart	SR/7
Informix Software Inc	16-17
Interbase Software Corp	92
Intergraph	107
International Power Machines	SR/30
IPL Systems	SR/24
JDS Microprocessing	36
Kelly Services	37
KMW Systems	74
Leasametric	66
Mansfield Software Group	SR/10
MBP Software & Systems	112
McCormack & Dodge	C4
MCI Communication Corp	58
Micro Focus	47
Microsoft	44-45
Mitek Systems	78
Mitron Systems	SR/26
Hitachi Data Systems	38-39
NCR Corp	30
NCR Corp	50-51, SR/26-SR/27
NEC	C3
Next Computer	26-27
Northern Telecom	48
Oracle Corp	9, 13
Pixel	66
Platinum Technology	25
Progress Software	52
Roim	34-35
SAS Institute	63
Software 2000	SR/14
Software AG	15
Software Engineering of America	11
Spur Products	71
Syncsort	6
3Com	SR/34-SR/35
3M Corp	18
3M Corp	72-73
Tandem Computer	SR/18-SR/19
TBS Software	40
Telebit	79
Televideo	32
Texas Instruments	48-49, 97-99
Toshiba America, Inc	SR/22-SR/23
Travtech	83
Trax Softworks, Inc	SR/7
Unisys	SR/16-SR/17
Unitech Systems	31
Universal Data Systems	82
White Crane	91
XDB Systems	49
Xidex/Dysan	91, 93, 95

This index is provided as an additional service. The publisher does not assume any liability for errors or omissions.

Have A Problem With Your Subscription?

We want to solve it to your complete satisfaction, and we want to do it fast. Please write to:

COMPUTERWORLD, P.O. Box 2043, Marion, Ohio 43305-2043.

Your magazine subscription label is a valuable source of information for you and us. You can help us by attaching your magazine label here, or copy your name, address, and coded line as it appears on your label. Send this along with your correspondence.

Address Changes or Other Changes to Your Subscription

All address changes, title changes, etc. should be accompanied by your address label, if possible, or by a copy of the information which appears on the label, including the coded line. Please allow six weeks for processing time.

Your New Address Goes Here

Name _____
Company _____
Address _____
City _____ State _____ Zip _____
Address shown: ☐ Home ☐ Business

Other Questions and Problems

It is better to write us concerning your problem and include the magazine label. Also, address changes are handled more efficiently by mail. However, should you need to reach us quickly the following toll-free number is available:

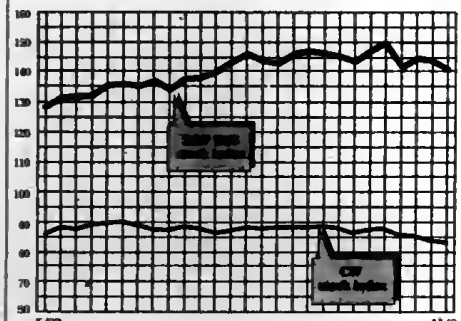
1-800-669-1002

Outside U.S. call: (614) 382-3322

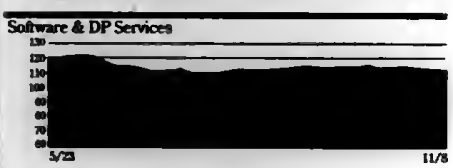
COMPUTERWORLD

P.O. Box 2043, Marion, Ohio 43306

STOCK TRADING INDEX



Indexes	Last Week	This Week
Communications	122.4	120.9
Computer Systems	83.0	78.6
Software & DP Services	113.1	112.1
Semiconductors	50.5	49.2
Peripherals & Subsystems	74.6	74.2
Leasing Companies	102.7	109.9
Composite Index	83.9	83.5
S&P 500 Index	143.6	141.2



Computerworld Stock Trading Summary

CLOSING PRICES WEDNESDAY, NOV. 8, 1989

Communications and Network Services

E		52-WEEK RANGE		CLOSE NOV. 8, 1989	WEEK NET CHNGE	WEEK PCT CHNGE
N	AMERICAN INFO TECHS CORP	38	46	61.375	0.5	0.8
Q	ANDREW CORP	28	16	24.25	0.5	2.1
Q	ARTEL COMMUNICATION CORP	6	2	5.625	-0.5	-8.2
N	AT&T	46	27	44.25	0.3	0.6
Q	AVANTEK INC	7	4	4.875	0.0	0.0
N	AYDIN CORP	21	14	18.8	-0.3	-1.3
N	BELL ATLANTIC CORP	105	26	102.25	-0.4	-0.4
N	BELLSOUTH CORP	58	39	51.875	-0.6	-1.2
Q	COMPRESSION LABS INC	11	3	6.375	-0.6	-8.9
Q	COMTEL CORP	37	16	30 125	-0.6	-2.4
Q	DATA SWITCH CORP	6	2	2.875	0.1	4.5
N	DIGITAL COMMUNICATIONS ASSOC	25	17	18.5	-0.8	-2.6
Q	DYNATECH CORP	21	17	17	-0.5	-2.9
Q	FIBRONICS INTERNATIONAL	7	3	5.375	-0.3	-3.8
Q	GANDALF TECHNOLOGIES	7	4	5.375	-0.4	-6.5
N	GENERAL DATACOMM INDS	7	4	4.875	0.0	0.0
N	GTE CORP	67	42	66.25	3.3	3.8
Q	INFOTRON SYS CORP	13	6	8.75	-0.5	-5.4
N	ITT CORP	78	49	58.375	-0.6	-1.1
N	M A COM INC	10	6	6	-0.1	-2.0
Q	MCI COMMUNICATIONS CORP	49	20	42.75	-0.5	-2.0
N	NETWORK EQUIPMENT TECH INC	28	14	26.125	0.4	1.5
Q	NETWORK SYS CORP	11	7	7.575	0.3	3.3
N	NORTHERN TELECOM LTD	23	14	21.875	-1.0	-4.4
Q	NOVELL INC	28	24	28	-2.9	-8.8
N	NYNEX CORP	84	65	77.75	1.5	1.8
N	PACIFIC TELESIS GROUP	47	29	42.25	-1.0	-2.3
A	PENRIL CORP	6	3	7.375	0.1	1.7
N	PLESSEY PLC	46	25	39.375	-0.4	-0.6
N	SCIENTIFIC ATLANTA INC	24	11	21.125	-0.4	-1.7
N	SOUTHWESTERN BELL CORP	59	36	55.125	0.1	0.2
Q	3 COM CORP	29	10	11 6	0.5	4.5
N	U S WEST INC	75	55	69.625	0.5	0.7

Computer Systems

Q	ALLIANT COMPUTER SYS	7	3	6	-0.3	-4.0
Q	ALPHA MICROSYSTEMS	6	6	6	-0.1	-2.4
Q	ALTOS COMPUTER SYS	9	6	7.875	-0.1	-1.6
A	AMDAHL CORP	23	11	11.25	-0.5	-5.3
Q	APPLE COMPUTER INC	50	34	45	-1.1	-2.4
N	BOLT BERANEK & NEWMAN	13	7	8.75	-0.1	-1.8
N	COMPAQ COMPUTER CORP	113	52	92.75	-13.3	-12.5
N	COMMODORE INTNL	20	7	7.375	-0.1	-1.7
Q	COMPUTER AUTOMATION INC	7	3	2.75	-0.1	-4.3
N	CONTROL DATA CORP	24	16	16	0.0	0.0
Q	CONVEX COMPUTER CORP	19	6	14.25	-0.5	-4.2
Q	CRAY RESH INC	58	33	34.875	-3.1	-8.2
Q	DAISY SYS CORP	7	1	1 063	-0.4	-28.1
N	DATA GEN CORP	20	13	13.625	-0.6	-4.4
N	DATAPOINT CORP	6	3	3.875	-1.1	-22.5
Q	DELL COMPUTER CORP	12	6	5.375	-0.4	-6.9
N	DIGITAL EQUIP CORP	122	58	67	-5.8	-8.2
N	FLOATING POINT SYS INC	4	1	1.625	-0.3	-13.3
N	HARRIS CORP	40	25	34.75	-2.4	-6.4
N	HEWLETT PACKARD CO	62	41	42.375	-4.1	-8.8
N	HONEYWELL INC	92	57	61.5	-1.3	-2.1
N	IBM	131	26	98 75	-3.3	-2.3
Q	INFORMATION INTL INC	16	12	12.25	0.0	0.0
Q	IPL SYS INC	6	4	6.875	0.3	3.8
N	MAI BASIC FOUR INC	13	3	3.5	-0.5	-8.7
N	MATSUSHITA ELEC INDL LTD	204	158	169.25	-4.0	-2.5
Q	MENTOR GRAPHICS CORP	22	12	16	-0.3	-1.5
N	NBI INC	3	1	0.688	-0.3	-28.7
N	NCR CORP	67	61	59 75	-1.6	-3.8
N	PRIME COMPUTER INC	21	7	7.625	0.1	1.7
Q	PYRAMID TECHNOLOGY	20	6	16.75	-0.3	-1.8
Q	SEQUENT COMPUTER SYS INC	38	16	34.75	-1.8	-3.6
Q	SHAREBASE CORP	4	0	0.5	-0.1	-11.2
Q	SILICON GRAPHICS CORP	27	14	23.75	-1.0	-4.0
Q	STRATUS COMPUTER	28	21	23	0.3	1.1
Q	SUN MICROSYSTEM INC	23	13	16.5	-0.4	-2.2
Q	SYMBOLICS INC	3	1	1.563	-0.1	-3.8
R	TANDEM COMPUTERS INC	26	16	24.25	0.1	0.8
N	TANDY CORP	49	36	42	-0.6	-1.5
N	ULTIMATE CORP	12	7	7.875	-0.5	-6.0
N	UNISYS CORP	31	14	14.8	-0.6	-4.1
A	WANG LABS INC	11	6	5.375	-0.1	-2.3

Software & DP Services

Q	ADOBE SYS INC	30	14	16.8	-0.3	-1.8
Q	AMERICAN MANAGEMENT SYS INC	16	11	13.25	-0.4	-3.8
Q	AMERICAN SOFTWARE INC	23	6	21.875	-0.6	-2.7
N	ANACOMP INC	9	4	6	0.4	6.1
Q	ANALYSTS INTERNATIONAL CORP	20	6	17.75	0.0	0.0
Q	ASHTON TATE	28	6	10.25	0.3	3.8
Q	ASK COMPUTER SYS INC	16	7	7.375	-0.1	-1.7
N	AUTO DATA PROCESSING	51	28	45.75	-0.8	-1.8
Q	AUTODESK INC	44	23	38.25	-0.8	-1.8
Q	BMC SOFTWARE INC	28	6	25.25	-1.8	-4.7
N	BUSINESSLAND INC	18	8	9.25	-0.3	-2.8
Q	COGNOS INC	6	4	4.375	-0.4	-7.8
N	COMPUTER ASSOCIATES INTL INC	22	11	10.625	-1.8	-16.8
Q	COMPUTER HORIZONS CORP	11	7	8.8	0.0	0.0
N	COMPUTER SCIENCES CORP	28	44	61.5	-0.8	-1.5
N	COMPUTER TASK GROUP INC	16	10	10.625	-1 1	-6.8
Q	COMSHARE INC	42	19	33.25	-1.6	-5.0
Q	CORPORATE SOFTWARE	16	9	16	0.6	2.6
N	GENERAL MTRS (CLS E)	56	36	55	0.4	0.7
Q	HOGAN SYS INC	7	4	6	-0.3	-4.8
Q	INFORMIX CORP	14	7	12.875	-0.1	-1.0
Q	INTELLICORP INC	6	3	4.875	0.0	0.0
Q	LEGENT CORP	22	18	28.375	-1.4	-5.0
Q	LOTUS DEVELOPMENT CORP	34	17	32.5	-1.5	-4.8
Q	MANAGEMENT SCI AMER	12	6	10.25	0.3	3.8
Q	MICROSOFT CORP	28	22	83.25	1.1	1.4
Q	NATIONAL DATA CORP	28	19	31.5	0.6	1.9
Q	ON LINE SOFTWARE INTL INC	6	5	6.25	0.1	1.6
Q	ORACLE SYS CORP	26	6	23.625	-0.6	-1.8
N	RANDOMIX SYS INC	16	12	13.125	-0.6	-2.8
Q	SYNOPSIS TECHNOLOGIES INC	16	3	3.75	-0.3	-6.3
Q	POLICY MGMT SYS CORP	37	22	33.5	-0.5	-1.5
Q	PROGRAMMING & SYS INC	21	14	20	-0.8	-3.8
Q	RELATIONAL TECHNOLOGY INC	16	6	6.5	1.8	33.3
N	REYNOLDS & REYNOLDS CO	34	20	24.75	-0.8	-1.0
Q	SAGE SOFTWARE INC	11	6	6.5	-0.8	-8.2
Q	SEI CORP	20	16	18.25	-0.3	-1.4
Q	SHARED MED SYS CORP	19	13	13.5	0.6	4.6
Q	SOFTWARE PUBG CORP	31	16	26	-0.4	-1.4
A	STERLING SOFTWARE INC	6	6	7.8	-0.8	-4.8
Q	SUMMAGRAPHICS CORP	22	13	20.125	0.1	0.6
Q	SYSTEMATICS INC	40	28	34	-2.3	-6.2
N	SYSTEM CENTER INC	28	14	18.75	-0.2	-1.3
N	SYS. SOFT INC	30	14	25.25	-0.3	-1.8
Q	WORDSTAR	3	2	2	0.1	3.2

Semiconductors

N	ADV MICRO DEVICES INC	11	7	7.375	-0.3	-3.3
N	ANALOG DEVICES INC	13	8	8.75	-0.6	-6.4
Q	ANALOGIC CORP	11	7	8.625	0.0	0.0
Q	CHIPS & TECHNOLOGIES INC	26	11	20.875	-0.1	-0.6
Q	INTEL CORP	39	16	31.75	-1.5	-4.5
N	MICRON TECHNOLOGY INC	29	10	10.625	0.2	2.4
N	MOTOROLA INC	63	36	54.5	-1.1	-2.0
N	NAT'L SEMICONDUCTOR	10	7	7 1/2 5	-0.4	-5.0
N	TEXAS INSTRS INC	47	30	30.625	-1.5	-4.7
A	WESTERN DIGITAL CORP	16	6	6.75	-0.3	-3.6

Peripherals

Q	ALLOY COMP	3	1	1.5	0.1	6.1
N	AM INTL INC	6	6	4.875	-0.1	-2.5
Q	AST RESH INC	11	7	9.875	-0.1	-1.3
Q	AUTO TROL TECH CORP	6	4	3.75	0.0	0.0
Q	EMCRTEC INC	20	6	14.75	1.3	9.3
Q	CIPHER DATA PRODS INC	11	4	5.25	0.0	0.0
A	COGNITRONICS CORP	8	2	7	-0.4	-5.1
Q	CONNOR PERIPHERALS	16	7	13.125	-1.0	-7.1
Q	DATAPRODUCTS CORP	16	6	6.5	-0.1	-1.4
A	DATARAM CORP	12	7	8.75	0.0	0.0
N	EASTMAN KODAK CO	52	42	42.375	-2.1	-4.8
N	E M C CORP MASS	6	3	4	0.3	8.7
Q	EMULEX CORP	12	6	6.5	-0.1	-1.8
Q	EVANS & SUTHERLAND	25	14	20.75	0.3	1.2
Q	ICOT CORP	3	1	1.5	0.1	6.1
Q	INTERLEAF INC	10	5	6.25	0.0	0.0
Q	IOMEGA CORP	6	2	3.125	0.0	0.0
Q	LEE DATA CORP	4	1	1.5	0.0	0.0
Q	MASSTOR SYS CORP	4	2	2.5	-0.3	-9.1
Q	MAXTOR CORP	12	7	8.75	0.0	0.0
Q	MICROPOLIS CORP	6	3	3.875	0.3	8.8
Q	MINISCRIBE CORP	6	1	1.5	0.1	4.0
N	MINNESOTA MNG & MFG CO	80	58	73.625	1.8	3.3
Q	PERSONAL COMP PRODUCTS INC	9	4	4.25	0.1	3.0
Q	PRIAM CORP	2	0	0.094	0.0	-24.8
Q	PRINTRONIX INC	10	7	10.125	0.0	0.0
N	QMS INC	12	6	10.5	0.1	1.2
Q	QUANTUM CORP	17	4	11.375	0.1	1.1
N	RECOGNITION EQUIP INC	13	6	6.625	0.1	1.8
Q	REXON INC	6	6	6.875	-0.1	-1.5
Q	SEAGATE TECHNOLOGY	16	7	12.5	-0.4	-3.8
N	STORAGE TECH CORP	23	6	13	-0.8	-3.7
Q	TANDON CORP	2	0	1	-0.1	-9.8
N	TEKTRONIX INC	24	17	17.625	-0.3	-1.4
Q	TELEVIDEO SYS INC	1	0	0.375	0.0	0.0
N	XEROX CORP	58	54	56.75	-1.8	-3.0

Leasing Companies

Q	AMPLICON INC	116	11	11.875	0.4	3.3
N	CAPITAL ASSOC INTNL INC	6	4	4.375	-0.3	-5.4
N	COMDISCO INC	34	18	26.75	-3.6	-11.9
Q	CONTINENTAL INFO SYS	4	0	0.563	0.2	63.7
Q	LDI CORPORATION	18	12	17.25	-0.1	-0.7
Q	PHOENIX AMERN INC	6	3	3.75	0.0	0.0
Q	SELECTERM INC	6	6	6.75	-0.3	-3.6

EXCH: N—NEW YORK; A—AMERICAN; Q—NATIONAL

Fire sale

Microsoft shares take off after it reports software OEM deal

The fire that temporarily interrupted trading on Friday was not as hot as the buying spree enjoyed by Microsoft Corp. investors. The software firm announced that it will license the source code for its OS/2 operating system to an OEM. Microsoft closed Thursday at 83¾, up 5½ points. Compaq Computer Corp. also enjoyed a good week after rolling out a line of personal computers that are targeted at minicomputer users (see story page 1). Compaq gained 2⅛ points to finish at 91¼.

IBM reported that it will license its microprocessor technology to Micron Technology, Inc. Micron added 1⅛ points to finish at 11⅛. 3Com Corp., which announced that its next release of 3+Open LAN Manager will support OS/2 file technology, climbed 1⅛ points to close at 11⅛. Intel Corp. investors were cheered by the latest chip sales projections, which were up for the first time since February. Intel climbed 1¼ points to finish at 32½.

Dell Computer Corp. announced its entry into the laptop computer market, and its stock closed at 5⅜, up ¼ of a point. Apple Computer, Inc. finished at 46, up 2¾ points.

On the downside, Digital Equipment Corp. slid 2⅜ points to close at 86⅛, and IBM dropped 1⅛ points to end at 97⅛.

JOSEPH J. FATTON

Not snow, nor rain, nor earthquake . . .

Pacific Stock Exchange shows its true IS grit during quake crisis

BY JEAN S. BOZMAN
CW STAFF

SAN FRANCISCO — An unusual cooperative effort among the nation's five options exchanges kept the Pacific Stock Exchange's (PSE) options trading floor in business following the earthquake Oct. 17, information systems executives at the exchanges said last week.

Trading on the stand-alone options exchange was suspended Oct. 18 because the options building, which is located two blocks away from the main PSE complex, lacked power and was closed pending structural inspections.

"The options exchange does not have an alternate floor in our Los Angeles exchange," said John Paraday, president of the PSE's IS division. "With no power on-site and no access to the building, this plan was put together on the fly."

The collaboration among the IS divisions of the PSE, the American Stock Exchange, the New York Stock Exchange and the Chicago Board of Options was unprecedented, participants said.

"It has never happened before," said Warren Kaiser, vice-president of market operations at the American Stock Exchange in New York. "But the systems that are needed to report the sales and to get the quotations are common to all the exchanges."

The joint effort proceeded with the blessings of the Securities and Exchange Commission (SEC), which wanted to get trading resumed as soon as possible.

The SEC "got involved the next day and chaired a teleconference with all the exchanges on the line," said Matthew C. Schmidt, president of the Financial Automation Corp., the IS subsidiary of the Philadelphia Stock Exchange. "Hours after we came up with s support plan, the traders from San Francisco got on two planes and flew to the other exchanges." They traded on the other exchanges for two days.

Even under normal conditions, all options traders share the same Chicago-based clearing system, as well as the same New York-based quotation system called the Options Price Reporting Authority. The only catch was that each "market-maker" handles s special group of options issues, and these issues had to be divided among the four trading floors.

Each exchange had to program in support for at least 25 of the San Francisco options issues, Schmidt said. Much of the work was done Wednesday night, even as 140 San Francisco traders and support personnel flew on two chartered planes to Chicago, New York and Philadelphia. Additional Quotron terminals and personal computers were moved onto the options trading floors, and mainframe master files were updated to support the San Francisco traders.

Those who worked on the communal backup are already thinking about formalizing it. "Would we do it again?" Kaiser said last week. "This thought has crossed a lot of people's minds now. We have found ways to relocate some or all of our issues to other trading floors."

Manhattan fire stalls stock exchange activity

BY ELLIS BOOKER
CW STAFF

NEW YORK — A Friday morning fire in downtown Manhattan delayed the opening of the New York and American Stock Exchanges by one hour and "temporarily affected" the Securities Industry Automation Corp. (SIAC), the exchanges' information systems arm.

SIAC is jointly owned by the New York and American stock exchanges.

The two-alarm fire at 55 Water St. reportedly began in a basement electrical vault.

Raymond R. Hipp, president of Comdisco Disaster Recovery Services, Inc. (CDRS), in Rosemont, Ill., said one customer at 55 Water St. had declared s disaster at the start of the fire for fear of being locked out of the building. That customer, Hipp said, continued to work at the IS site on Friday but was to decide Saturday whether to move into s CDRS disaster recovery site. "The questions now center on safe access to the building and electrical power to the building," Hipp said.

A Manufacturers Hanover Corp.'s data center on the building's 39th floor was considered safe, a spokeswoman said.

Chemical Banking Corp.'s data center also sustained no damage in the fire, according to s worker there.

Senior writer Alan J. Ryan contributed to this report.

Facing competition, 3Com stirs up its LAN Manager

BY CHARLES VON SIMSON
CW STAFF

SANTA CLARA, Calif. — 3Com Corp. last week tightened its wagon's hitch to Microsoft Corp.'s LAN Manager star, announcing that 3+Open LAN Manager Version 2.0 would be available in the third quarter of 1990.

3Com is hoping that by multiplying the number of supported protocols and continuing to support OS/2 LAN Manager's high-performance file system (HPFS), it can begin, with 3+Open, to forge s network management capability that will meet the needs of managers of multivendor environments who have been forced to go on their own to develop homegrown solutions.

"From s network management perspective, there has been s lack of standard protocols and interfaces," said Eric Benhamou, vice-president and general manager of 3Com's distributed systems division. "We believe that inhibitor has been remedied. We have made great progress on standardizing protocols."

Analysts are quick to caution that while it is a solid beginning, 3+Open LAN Manager is only an early hint of a true solution. "Microsoft has laid a strong foundation, but only the very expensive, mainframe-based Netview system from IBM really gives you s view of an entire network system," said Charles Haynes, vice-president of technology and planning at Lanquest Group, a San Jose, Calif.-based network research firm. "Other vendors, such as 3Com, have just made a beginning at attacking the problem."

Compaq competition

3Com will face its most direct competition in the personal computing server market from Compaq Computer Corp., which last week announced its own Extended Industry Standard Architecture-based version of OS/2 LAN Manager, with support for OS/2's multiprocessing capabilities (see story page 1). "Compaq has always offered an aggressive price/performance option," said s network manager at Pillsbury Corp. in Minneapolis. "We have used and evaluated s number of products, including some from both 3Com and Novell, Inc. This may be another technology worth exploring."

3Com will stir into 3+Open LAN Manager Version 2.0 primary support for s number of additional protocols, including Appletalk filing protocol, Transmission Control Protocol/Internet Protocol, Open Systems Interconnect and IBM Netbios extended user interface. In addition, the company has embraced both CMOT and Simple Network Management Protocol (SNMP) technologies after originally shunning SNMP. Its promised network management capabilities, previewed at a recent marketing conference, will support both protocols.

Coupled with HPFS, the newest version of 3Com's operating system is a strong enhancement. "The key for us is not file performance but the distributed access to file information," Benhamou said.

Freshening its bet on OS/2, 3Com will also add a multiprocessor board option to its line of network servers. This will allow 3Com to take advantage of the OS/2 ability to increase performance by delegating applications processing between two processors. Although promising the multiprocessing capability for fall 1990, 3Com has not yet begun its development effort, and 3Com spokesman Nick Parham said the decision had not yet been made on whether to license multiprocessing technology or develop it in-house.

In introducing the network management foundation, Benhamou confirmed the trend among large users to grow their own network management solutions.

Bass

FROM PAGE 1

code to develop a patent-pending, proprietary design for an IBM AT bus-based coprocessor board and software to exploit OS/2's coprocessor capabilities.

The pace of development that the venture capital-funded company maintains and the prices it sets will have repercussions for other companies developing or using the multiprocessing features of OS/2 LAN Manager applications.

Although other companies have the option of licensing the code directly from Microsoft, they would still have to duplicate Parallan's year-long development efforts.

Grant thee OS/2

Compaq Computer Corp., the other company granted OS/2 source-code access, has developed a board specifically optimized for its high-end Extended Industry Standard Architecture (EISA)-bus Systempro server, announced last week (see story page 1), and is unlikely to offer the coprocessor board to the OEM market.

Parallan will be the sole initial supplier of coprocessor boards to OEMs that wish to avoid building their own product from scratch.

"Monopoly is not s word we like to use, but for now, it does describe the situation in the OEM market," said Parallan Vice-President of Marketing and Sales Richard Nisley.

"Monopoly is a great word," said Mike Murray, director of networking business at Microsoft. "We saw a bunch of very aggressive, bright guys and figured there was no better way to get this technology out into the hands of OEMs."

OEMs can purchase the product either as is or as s template to develop modified EISA and Micro Channel Architecture-bus coprocessing products. "If [Parallan's] prices get too high, OEMs can buy the code from us and start from scratch," Murray said.

The fine print

Under terms of the source-code access agreement, Parallan and Compaq are obligated to turn OS/2 coprocessing software developments over to Microsoft to be bundled into LAN Manager and licensed to developers.

For both Compaq and Parallan, the reward is s long lead time in code and hardware development. Nisley estimates that the company put about 15 man-years into the coprocessor software to date, with s large part of its development staff working directly with Microsoft engineers.

Parallan has agreed to charge an industry-standard price to developers that want to use its initial product, which was announced last week.

The price was set by s survey of average margins among language and database developers. Parallan will be free to charge what the market will bear on subsequent coprocessing products.

3Com Corp. has been among the company's first prospective customers. While 3Com has not signed any contracts for the development of the multiprocessor board, promised for the fall 1990 shipment of 3+Open LAN Manager, there have been talks between the two companies directed at using Parallan technology for the coprocessing hardware and software features of newly announced 3+Open LAN Manager Version 2.0 (see story this page), a source close to both companies confirmed.

Compaq

CONTINUED FROM PAGE 1

largest supplier of PCs to move into integrated system sales.

Given the trend toward downsizing, the issue for users may not be whether to swap minis for PCs, but which architecture to rely on, said David George, executive vice-president at Chicago-based PC Quote, a real-time financial services firm. George has standardized on PCs and has a big investment in IBM's Micro Channel Architecture (MCA); he is leery of Compaq's EISA bus but will consider it.

Interest in the Systempro was high at Drexel Burnham Lambert, Inc. in New York. Marty Greenwood, Drexel's manager of office systems, said industry efforts to move to a client/server architecture over the last two years have been hindered by the performance constraints of PC hardware. "If you try to run a multiuser database on a LAN today, it is difficult to implement a full-scale transaction processing system."

If the Systempro lives up to Compaq's performance claims, it will make it possible to move applications to a PC without sacrificing any performance, Greenwood predicted. "This machine is so much beyond [a mere] 486," he said.

Minicomputer makers such as Digital Equipment Corp. and IBM downplayed Compaq's performance claims. Both vendors have plans for 486-based computers.

"The AS/400 is a winner, and tens of thousands of customers will back that up," an IBM spokesman said. The Systempro is better positioned against DEC's low-end, Unix-based Vaxstation 3100 or 5400 than the 6130, said Dean Curran, group marketing manager for PCs and PC integration at DEC. He said "Compaq has stepped over a fine line . . . and overstated [the Systempro's] capability."

Some analysts are not so sure. Mike Geran, vice-president of research at Nikko Securities Co. International, said there are some tasks, such as file servers, that can be better served on a price/performance basis on machines like the Systempro or Netframe Systems, Inc.'s Unix-based server.

IBM and DEC are "whistling in the dark, hoping the bogeyman won't get them," said Aaron Goldberg, a vice-president at International Data Corp. in Framingham, Mass. "They don't realize that Compaq's computers are very real and that the low end is where the battle is fought for network server and multiuser systems," he added.

At the heart of the controversy are performance claims touted by Compaq, based primarily on Neal Nelson & Associates Business Benchmark test suite.

For example, tests run against a DEC VAX 6130 and Hewlett-Packard Co. 9000 Series 835 in a Unix-based 60-user configuration showed that the $25,000 Systempro was more than six times faster than the roughly $160,000 DEC VAX and more than three times faster than the $100,000 HP 9000.

"Compaq beats the DEC machine rather roundly on every [test], whereas with HP, sometimes the 9000 was faster and sometimes the Compaq was," said founder Neal Nelson. He added that tests run with his database of more than 350 machines have consistently placed a number of PCs and small multiuser systems at the high end of the performance spectrum.

Yet the Systempro's impact will depend on a series of factors, not the least of which is whether Compaq can convince information managers to purchase minicomputer-level equipment through computer dealers. Mike Swavely, president of Compaq North America, said the Systempro will not be sold directly.

Also, most minicomputers are backed by vertical software packages. Compaq is already moving to entice developers to port their minicomputer-based vertical software to its platform.

Greg Cross, corporate marketing manager at Fact International in Auckland, New Zealand, said the developer has agreed to port its Wang Laboratories, Inc.-based software to the Systempro.

Another obstacle barring the way for the Systempro is IBM's MCA, which has a three-year lead with its installed base.

"This is the second-most exciting announcement of 1987, only it's two years too late," said James A. Cannavino, vice-president and general manager of IBM's Personal Systems Group.

Bus rolls in

Compaq's Deskpro 486 is its first PC to utilize the EISA bus architecture

- **Microprocessor:** Intel 1486
- **I/O bus:** 32-bit EISA; Compaq Flex architecture
- **Clock speed:** 25 MHz
- **MIPS:** 15
- **System RAM:** 4M (expandable to 100M)
- **Hard disk:** 120M, 320M or 650M bytes
- **Floppy disk:** 1.2M byte, 5¼ in.
- **Graphics:** VGA, EGA, CGA, MDA
- **Price range:** $13,999 - $20,499

SOURCE: COMPAQ COMPUTER CORP. CW CHART: FRANK C. O'CONNELL

Compaq vies for LAN pie

Minicomputer makers may be quick to dismiss as arrogant Compaq bid to grab a slab of their pie, but network server vendors will probably head for the pie safe — and with good reason.

Analysts who are divided over the extent to which Compaq's dual-processor, EISA-based Systempro will affect the midrange market (see story page 1), have on such doubts about its impact on the server market. "The pull-through market [for Systempro] is definitely Unix and network servers," said Bruce Stephen, an analyst at International Data Corp. (IDC). Without any overt push, Compaq has found itself the second-most prolific supplier of network servers, said market researcher Gartner Group, Inc. IDC said Compaq holds 30% of the overall non-dedicated server market and is the No.1 choice for users configuring PC as servers.

The icing on the cake for Compaq is the successful execution of a joint development agreement with Microsoft Corp. that will result in the addition of key features to the latter company's core LAN Manager product such as a multiprocessing support architecture that splits protocol overhead and OS/2's High Performance File System onto different CPUs.

While Compaq LAN Manager 386/486 will be offered as an option, Compaq also enjoys support from Novell, Inc. For six months, Computerland has offered users a preconfigured server based on Compaq hardware bundled with a preloaded Novell Netware operating system.

Although Microsoft officials point to Compaq's LAN Manager license and development efforts as proof that the desktop vendor is more committed to LAN manager, Gary Stimac, Compaq's senior vice-president of systems engineering, disagreed. Netware is offered by many Compaq dealers, while LAN Manager is available only as an OEM product. Compaq was unsuccessful in convincing current LAN Manager licensees to offer a version tailored to Compaq's EISA platform, Stimac said.

PATRICIA KEEFE

Grid, NEC join EISA bandwagon

BY RICHARD PASTORE
CW STAFF

The EISA trenches on the PC architecture front got considerably more crowded last week as NEC Technologies, Inc. and Grid Systems Corp. jumped in with personal computers based on Extended Industry Standard Architecture (EISA) and its forebear, the AT bus.

On the same day as Compaq Computer Corp.'s EISA debut (see story page 1), NEC announced its desktop Powermate 486/25E and Powermate 386/33E, based on Intel Corp.'s 1486 and 80386 microprocessors, respectively. Both incorporate the EISA bus.

The company has aimed both machines at the high-end user in such intensive application areas as computer-aided engineering and graphics. The personal computers are also positioned as network servers.

The 486/25E runs at 25 MHz and is configured with 2M bytes of random-access memory (RAM), expandable to 32M bytes. The PC ships with a 1.2M-byte, 5¼-in. floppy disk drive and a hard disk drive. It also incorporates a small computer systems interface (SCSI) peripheral controller that is used for the attachment of up to seven devices.

The 486 model will ship in January, according to NEC, and will be priced from $12,000 to $14,000, depending on hard disk capacity.

The 386/33E, which runs at 33 MHz, features the same initial RAM and expandability factor as well as the SCSI controller. Depending on hard-disk capacity, the model will cost from $8,500 to $10,800 when it ships in January.

Nock and NEC

NEC also introduced two machines, the Powermate 386/25 and the multiuser-supporting Businessmate 386/25, based on the EISA bus.

Priced at $6,400, the Powermate model is available now. The Businessmate PC will ship next month and will have a price tag of $8,550, the company said.

Grid, which has already introduced a Micro Channel Architecture-based box, rolled out six models last week, two of which are EISA machines. All six are designed to be modularly upgradable, company said.

With this modular platform, customers purchasing a 386, 16-MHz model, for instance, can upgrade to a 386, 33-MHz processor or even a 486 processor, according to Grid.

The flagship, the 486EI-25, is based on the 1486 microprocessor and runs at a 25-MHz clock speed. The EISA-based machine comes standard with 2M bytes of RAM, expandable to 64M bytes. The $9,000 computer is scheduled to ship in the fourth quarter.

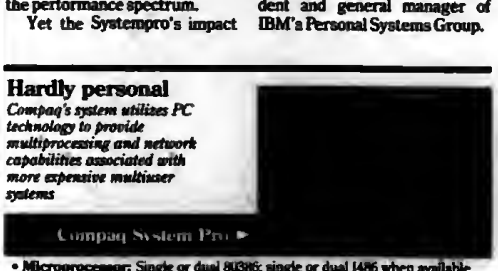
Grid's 386EI-33 model is similar except for its 33-MHz speed, 386 microprocessor and $7,000 price tag.

The other four models in the line feature AT-style buses and are based on 386 chips. They run at clock speeds ranging from 16 to 33 MHz and range in price from $3,000 to $6,000. The models are expected to ship in December or January.

All the configurations come equipped with a 3½-in., 1.44M-byte floppy disk drive. Grid also offers a variety of hard disk drive options and ST-506, enhanced small device interface and SCSI drive controllers.

Hardly personal

Compaq's system utilizes PC technology to provide multiprocessing and network capabilities associated with more expensive multiuser systems



- **Microprocessor:** Single or dual 80386; single or dual 1486 when available
- **Clock speed:** 33 MHz
- **System RAM:** 4M bytes (expandable to 256M bytes)
- **Floppy disk:** 1.2 bytes, 5¼ in.
- **Price:** $15,999 - $25,999

SOURCE: COMPAQ COMPUTER CORP. CW CHART: JOHN YORK

NCR fires back at EISA sally

Firm rolls out I486 model, announces IBM and Businessland links

BY RICHARD PASTORE
CW STAFF

NEW YORK — Call the latest installment of the *Bus Wars* saga *The Micro Channel Strikes Back.*

A day after Compaq Computer Corp. one-upped the Micro Channel Architecture (MCA) with high-profile Extended Industry Standard Architecture (EISA) rollouts, NCR Corp. countered with a three-pronged assault. Last Tuesday, it unveiled an Intel Corp. I486-based MCA personal computer, earned the official blessing of MCA emperor IBM and landed its machines on the coveted shelves of Businessland, Inc. stores.

Backed by a John Williams-style overture, NCR's PC486/MC touched down here amid rolling clouds of steam pierced by green sabers of laser light. Chairman and Chief Executive Officer Charles Exley Jr. hailed the PC as the first of a Micro Channel fleet.

NCR made clear that it has officially chosen sides; it has no plans to develop a machine based on rival EISA, Exley said. And IBM has taken the company under its wing: It will cooperate with NCR's efforts to develop and market future MCA chip sets and peripheral products.

With IBM's blessing and full specification disclosure, "NCR intends to be an early-to-market second source for Micro Channel chip sets," said Thomas Mays, senior vice-president of NCR's General Purpose Products Group.

Businessland CEO David Norman revealed the third part of NCR's MCA strategy: an alliance with the nation's No. 1 computer retailer. Beginning next month, the 125-store chain will carry NCR's entire PC line.

NCR claimed its new PC, which will run DOS, OS/2 and Unix, can outpace the fastest Intel 80386-based, 33-MHz machines available (see chart). NCR promised a December delivery, noting it will ship only machines with the bug-corrected version of the 486 chip.

Joel Hartman, assistant provost at Bradley University in Peoria, Fla., acknowledged a need for such a 486-based PC in the institution's engineering, computer sciences and art areas. But "architecturally, we're staying with the XT or EISA architecture," Hartman said, explaining that he has an installed base of 1,200 machines with the AT bus — including several NCR PCs.

Observers said that the pacts with Businessland and IBM will likely strengthen NCR's PC market share, now estimated to rank 10th in the U.S.

"It could give them the market-channel mastery they want and frankly need to become a credible player," said Paul Zorfass, an analyst at The Yankee Group in Boston.

"I'm glad to see that they're taking this kind of step because it seems like the PS/2 [Personal System/2] and OS/2 are shaking out to be the major players in the whole personal computer industry," said Dennis Melville, vice-president of information services who runs an NCR shop at Big V Supermarkets, Inc. in Florida, N.Y.

Sides chosen

NCR has clearly picked which bus team it will be on by releasing the first of a series of MCA-based PCs

- Microprocessor: Intel I486
- I/O bus: 32-bit MCA
- Clock speed: 25 MHz
- MIPS: 15
- System RAM: Up to 16M bytes
- Hard disk: 100M or 200M bytes
- Floppy disk: 1.44M bytes, 3½ in.
- Graphics: Super VGA
- Price: $9,995 - $16,995

SOURCE: NCR CORP. CW CHART: JOHN YUVA

They like it

NCR's commitment to MCA naturally sits well with IBM. "NCR's plans further enhance Micro Channel's position as the industry's standard architecture for high-performance personal computers," said James Cannavino, IBM vice-president and general manager of Personal Systems.

Businessland's Norman said his firm chose NCR from among several competitors vying for the retail alliance because of its broad product line, overseas presence and leadership in technology such as the small computer systems interface.

In addition, in a suite of tests for multivendor compatibility, "NCR's [machines] were the only PC products that our evaluation group could not find compatibility bugs in," Norman said. Other machines tested turned up with at least one IBM 370-compatibility quirk, he said.

Although Norman claimed that all types of PCs — including EISA-based products — were considered for the alliance, he clearly favors the Micro Channel.

"These nine guys are off in never-never land," Norman said, referring to the EISA-backing Gang of Nine. "I see no demand for EISA in corporate America." Businessland's primary vendor is IBM.

Some analysts think the retail chain might have done better to offer shoppers a choice of architectures.

An alliance with Hewlett-Packard Co., for instance, would have given Businessland a strong brand name and the EISA alternative, said Bruce Stephen, an analyst at International Data Corp. in Framingham, Mass. "NCR is not that well known as a PC company," he said.

Flood of Comdex intros under way

BY JAMES DALY
CW STAFF

Although the enormity and white noise of Comdex usually prompt vendors to make their introductions in the weeks leading up to the show, several major announcements will pepper the halls and hotels of Las Vegas.

Among the products to be showcased are the following:

- Hewlett-Packard Co. will announce Release 2.0 of SoftPC Synthetic Hardware, a PC software emulator that allows Unix users to run DOS applications in a Unix workstation's windowed environment. The release provides IBM Enhanced Graphics Array display emulation and scalable DOS windows.
- Tatung Company of America will unveil a workstation based on Sun Microsystems, Inc.'s Scalable Processor Architecture design. The reduced instruction set computing-based Wonder-workstation is capable of processing 15 million instructions per second. It will cost approximately $7,000 and is scheduled to be available in the third quarter of next year, officials at the Long Beach, Calif., firm said. Additionally, a 25-MHz Intel Corp. 80486-based personal computer based on IBM's Micro Channel Architecture will be announced and will be available in January, according to the company spokesmen.
- Ashton-Tate Corp. will demonstrate a beta-test version of Dbase IV Version 1.1. The company will also preview an early version of the server edition of the database. Three other products — the Multimate Version 4.0 word processing software, Applause II graphics software (see story page 49) and the Control Room utilities package — will also be highlighted at the show.
- Eastman Kodak Co. will announce a pair of storage products, including a write-once read-many optical disc capable of storing 8.2G bytes. A 5¼-in. disc library offering up to 75G bytes of storage in a box approximately the size of a two-drawer filing cabinet will also be unveiled. According to the firm, the disc library will be available by the end of the year, starting at $30,000, while the optical disc will be available in the third quarter of next year with no pricing yet established.

Second-class postage paid at Framingham, Mass., and additional mailing offices.
Computerworld (ISSN 0010-4841) is published weekly, with a single combined issue for the last week in December and the first week in January of 1989 by CW Publishing/Inc., 375 Cochituate Road, Box 8171, Framingham, Mass. 01701-9171.
Copyright 1988 by CW Publishing/Inc. All rights reserved.
Computerworld can be purchased on 35 mm microfilm through University Microfilm Int. Periodical Entry Dept., 300 Zeeb Road, Ann Arbor, Mich. 48106. *Computerworld* is indexed; back issues, if available, may be purchased at $2.00 per issue, plus postage. Call (800) 669-1002.
Photocopy rights: permission to photocopy for internal or personal use or the internal or personal use of specific clients is granted by CW Publishing/Inc. for libraries and other users registered with the Copyright Clearance Center (CCC), provided that the base fee of $3.00 per copy of the article, plus $.50 per page is paid directly to Copyright Clearance Center, 27 Congress Street, Salem, MA 01970.
Reprints (minimum 500 copies) and permission to reprint may be purchased from Sharon Bryant, CW Publishing/Inc., 375 Cochituate Road, Box 8171, Framingham, Mass. 01701-9171. Subscriptions call toll free (800) 669-1002.
Requests for missing issues will be honored only if received within 60 days of issue date.
Subscription rates: $2.00 a copy; U.S. — $48 a year; Canada — $110 a year; Central & So. America — $130 (surface), $250.00 (airmail) a year; Europe — $195 a year; all other countries — $295 a year. Four weeks notice is required for change of address. Allow six weeks for new subscription service to begin.

POSTMASTER: Send Form 3579 (Change of Address) to *Computerworld*, P.O. Box 2044, Marion, OH 43306.

Unix industry sights the age of unification

BY AMY CORTESE
CW STAFF

The Unix industry may yet see its wildest dream — unification — come true. In the wake of AT&T indications that it would open up control of its Unix Software Operation (USO) to outsiders, the major Unix vendors are stepping up efforts to come to an accord.

Last week, the Open Software Foundation, USO and Unix International, AT&T's advisory group, pronounced that they would accelerate discussions on finding ways to collaborate.

The discussions will focus on technology exchange. Mike DePazio, USO Director of Systems Software, said AT&T is doing the legal and financial work necessary and "could be in a position in early 1990" to begin selling interest in USO.

Merger speculations

Many observers are speculating that Unix International and OSF will merge, but both expressed reservations about the possibility.

OSF President David Tory said that a merger is only a discussion item at this stage but that "there is no built-in impediment to that happening." More importantly, he stressed, Unix International and OSF are working toward a common goal and will bring together development streams, whether it be merging processes or organizations.

DePazio said that the groups agreed two weeks ago that it will be beneficial to acknowlege ongoing discussions. "The real competition is not between UI and OSF," he said "but between open systems and proprietary systems."

Tomorrow, OSF will discuss the plans for its revamped OSF/1 operating system and progress on two outstanding requests for technology.

CORRECTION

In the Sept. 18 issue of *Computerworld*, Bull H. N. Information Systems, Inc. was incorrectly listed as Honeywell Bull in the Medium-Scale Systems chart in the annual Hardware Roundup section.

Marty Gruhn was incorrectly identified on the Viewpoint page of the Oct. 30 issue. Gruhn is the former vice-president and co-founder of Sierra Group, Inc.

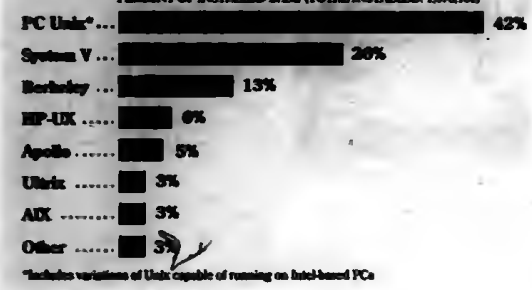
TRENDS

After years of slow growth in specialized markets, Unix shipments are starting to erupt, with the value-added reseller channel and personal computer dealers driving the operating system into broader markets.

PC Unix is the leading variant of Unix, passing AT&T's System V in terms of units shipped and number of licenses.

Unix systems, year-end 1988 installed base

PERCENT OF INSTALLED BASE (TOTAL INSTALLED: 1,078,100)

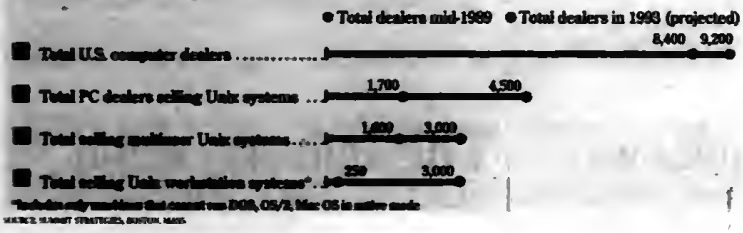


*Includes variations of Unix capable of running on Intel-based PCs

SOURCE: INTERNATIONAL DATA CORP., FRAMINGHAM, MASS.

Unix end workstations will both be pulled into broader markets as they begin to lose their mystique. By the end of 1993, more than half of all PC dealers could be selling Unix-based systems.

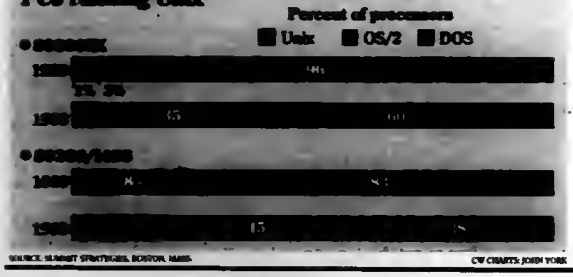
Growth of Unix dealer channel (U.S. dealers)



*Includes only machines that connect non-DOS, OS/2, Mac OS in native mode

SOURCE: SUMMIT STRATEGIES, BOSTON, MASS.

PCs running Unix



SOURCE: SUMMIT STRATEGIES, BOSTON, MASS. CW CHARTS: JOHN YORK

Unix has made a name for itself in the workstation market. But it has some catching up to do in the Intel-based PC market where DOS and OS/2 have initial leads.

NEXT WEEK

Outsiders have a hard time believing it, says **George Brenner,** MCA's vice-president of corporate IS, but entertainment is a serious business, and the IS function is as critical to success in a company such as his as it is for manufacturing or consumer products companies. Manager's Journal profiles this New Yorker in Hollywood.

ALAN LEVENSON

Tryouts of ISDN produce both optimism and frustration. Some companies are able to make immediate use of available services and most see an exciting future, but few can do everything they'd like right now. Executive Report features detailed evaluations of current ISDN performance from those who paid for front-row preview seats.

INSIDE LINES

Display wars update

Don't count out PM Lite — the downsized version of OS/2's Presentation Manager graphical interface running under DOS — just yet. Sources say PM Lite will not have a graphical interface because IBM and purported co-developers cannot get it in under the 1M-byte memory barrier. IBM's Jim Cannavino talked with Microsoft's Bill Gates last week in an effort to hash out some sort of an agreement that supposedly would allow both sides to save face, according to those who claim to be in the know. A draft of the agreement supposedly is already on Cannavino's desk. Meanwhile, there's also talk of IBM bundling Microsoft's Windows with an upcoming release of DOS. More rumors that have been trickling out of Microsoft say Windows 3.0 and Omega have been delayed because Microsoft can't get them to perform adequately. Meanwhile, Paul Allen, formerly Microsoft's DOS czar and now head of Asymetrix in Bellevue, Wash., reportedly is furious that he has had to hold up release of his product because of the Windows 3.0 delay.

High stakes in the desert

The Interface Group is charging as much as $10,000 a week to provide a trailer in the parking lot of the Las Vegas Convention Center for those companies that weren't able to secure a booth inside for the Comdex trade show. Conference rooms have been going for $30,000.

Once burned, twice shy

After *Computerworld* received a telephone call from a source claiming to have found the Ping-Pong virus in a program published by Borland, we called Philippe Kahn, Borland's founder, to find out whether there was any merit to the tip. There is absolutely no basis to the story, Kahn said emphatically. This is probably a rumor that is being bandied about by the competition, he speculated. "It sounds a lot like the same sort of thing that Microsoft did after the earthquake, when they said we were out of business," Kahn said.

Worlds apart

The Iron Curtain may be coming down, but the powers that be behind the "Bamboo Curtain" seem to be resolutely holding it up against the winds of change. At least that's the view of the Association for Computing Machinery. According to a reliable source, the ACM, which dispatched a stinging rebuke in August to Chinese leaders in the wake of the Tiananmen Square massacre, has turned down a invitation that was recently tendered by the Chinese Computer Federation to visit China.

A trend in the making

Sources say that AT&T is considering going a major step beyond mere collaboration or technology exchanges with its nemesis, the Open Software Foundation (OSF). Robert Kavner, who heads up AT&T's Data Systems Group, reportedly attended the last OSF meeting as an invited guest and was said to give strong indications that AT&T is contemplating spinning off its entire Unix System Operations group into a separate corporation, much as Apple did with its software division, to allay third-party developer fears.

Lessons to be learned

DEC's VMS operating system is one of the most secure available, and the company goes to considerable lengths to instruct systems managers in how to make their systems secure, said Steve Redfern, secure system marketing consultant at DEC. In light of recent breaches on scientific DEC-based networks, what's needed is for systems managers, many of whom are not properly trained in security procedures, to take security more seriously, according to Redfern. "Security at research and academic institutions is not near and dear to their hearts," he said.

You won't be able to feed news tips to News Editor Pete Bartolik unless you too have been consigned to glitter gulch this week for the annual PC ball. But Assistant News Editor Jim Connolly is standing by at 800-343-6474 to stay on top of what's happening in the real world.

You'll find our printers exceed specifications in the most crucial area of all. Confidence.

In a world where anything can go wrong, isn't it nice to know something won't? NEC printers. These machines have built the kind of reputation that used to be associated only with National Heroes and World Series MVPs. Steady, reliable, clutch performers.

They are: the Pinwriter® family of dot matrix printers, and the Silentwriter® family of page printers. And their legendary reliability and print quality have inspired spontaneous outbursts of applause on more than one occasion. Our Pinwriter printers are 24-wire workhorses that consistently deliver unmatched print quality, type variety and the highest resolution graphics.

Our Silentwriter printers are laser-class printers that are in a class all their own. They offer a PostScript® interpreter, a wide variety of type fonts, and extensive memory. Which makes them the perfect page printers for desktop publishing environments and work group settings. And they're all from NEC, the $24 billion world leader in computers and communications. Talk about confidence building.

NEC

WE'RE MAKING THINGS BETTER FOR YOU.

NEC Information Systems, Inc., 1414 Massachusetts Ave., Boxborough, MA 01719. 1-800-NEC-INFO. In Canada, 1-800-343-4418.

C&C

© Copyright 1989 NEC Information Systems, Inc. Pinwriter and Silentwriter are registered trademarks of NEC Corp. PostScript is a registered trademark of Adobe Systems, Inc.

There's only one software company that can lead you into the next millennium.

To meet the challenges that await you in the next age of computing, it only makes sense to follow an experienced guide ■ A company with a proven track record of success, leadership and technological achievement ■

McCormack & Dodge is just that company ■ We can point to a 20-year history of leadership in Human Resource and Financial software ■ A history marked by accomplishments like the first truly integrated processing environment – Millennium® ■ The first DB2 systems development tool from an applications software vendor ■ And now, the first true SAA workstation ■

Call 1-800-343-0325 and ask for our white paper which describes in detail how McCormack & Dodge is dealing with your concerns about SAA ■ You'll find out why our 20 years of success is just what you need to face the next 20 years of change ■

20 YEARS OF SUCCESS IN FINANCIAL AND HUMAN RESOURCE SOFTWARE.

McCormack & Dodge

a company of
The Dun & Bradstreet Corporation

© 1989 SAA is a trademark of IBM.